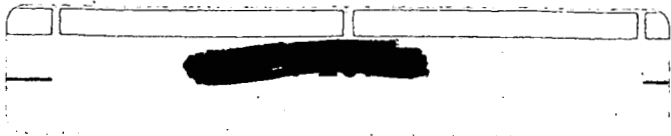


**PIT 5 EXPERIMENTAL TREATMENT FACILITY  
(ETF) REMOVAL ACTION WORK PLAN**

**DOCUMENT DATE 00/00/00**



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**PIT 5**  
**EXPERIMENTAL TREATMENT FACILITY (ETF)**

**REMOVAL ACTION**

**WORK PLAN**

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

Prepared by:

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Cincinnati, Ohio

For:

The United States Department of Energy

## WORK PLAN

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## WORK PLAN

### PIT 5 EXPERIMENTAL TREATMENT FACILITY (ETF) REMOVAL ACTION

#### 0.0 EXECUTIVE SUMMARY

This document is intended to provide a work plan for the Pit 5 Experimental Treatment Facility (ETF) Removal Action as required by the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and the Consent Agreement Removal #11. This document will also provide closure information consistent with the Resource Conservation and Recovery Act (RCRA), since the ETF is part of the designation that Pit 5 is a Hazardous Waste Management Unit (HWMU). The activities to be conducted during this removal action are designed to mitigate the potential release of contaminants from the ETF until final remediation is performed under CERCLA actions within Operable Unit 1 of the Fernald Environmental Management Project (FEMP), formerly known as the Feed Materials Production Center (FMPC).

The FEMP is proposing the removal of the potential source of a release at the ETF at this time to satisfy this time critical removal action. Once the CERCLA Record of Decision (ROD) is complete, soils determined to be contaminated in the immediate area will be addressed in the final remediation for Operable Unit 1. This removal action work plan is designed to protect human health and the environment both on and off site.

#### 1.0 INTRODUCTION AND PURPOSE

The FEMP is a contractor-operated federal facility once used for the production of purified uranium metal for the United States Department of Energy (DOE). The facility is located on 1050 acres in a rural area approximately twenty (20) miles northwest of downtown Cincinnati, Ohio. On July 18, 1986, a Federal Facilities Compliance Agreement (FFCA) was jointly signed by the United States Environmental Protection Agency (USEPA) and DOE. The purpose of the FFCA is to ensure that environmental impacts associated with past and present activities at the FEMP are thoroughly investigated so that remedial action alternatives can be assessed and the appropriate ones implemented. On November 21, 1989, the FEMP was included on the National Priority List (NPL). Then on June 29, 1990, USEPA and DOE entered into a Consent Agreement which amended the provisions relating to the completion of the Remedial Investigation/Feasibility Study (RI/FS) and remedial action of the FFCA to meet CERCLA requirements. Per this Consent Agreement, DOE is required to submit work plans to USEPA for review and approval.

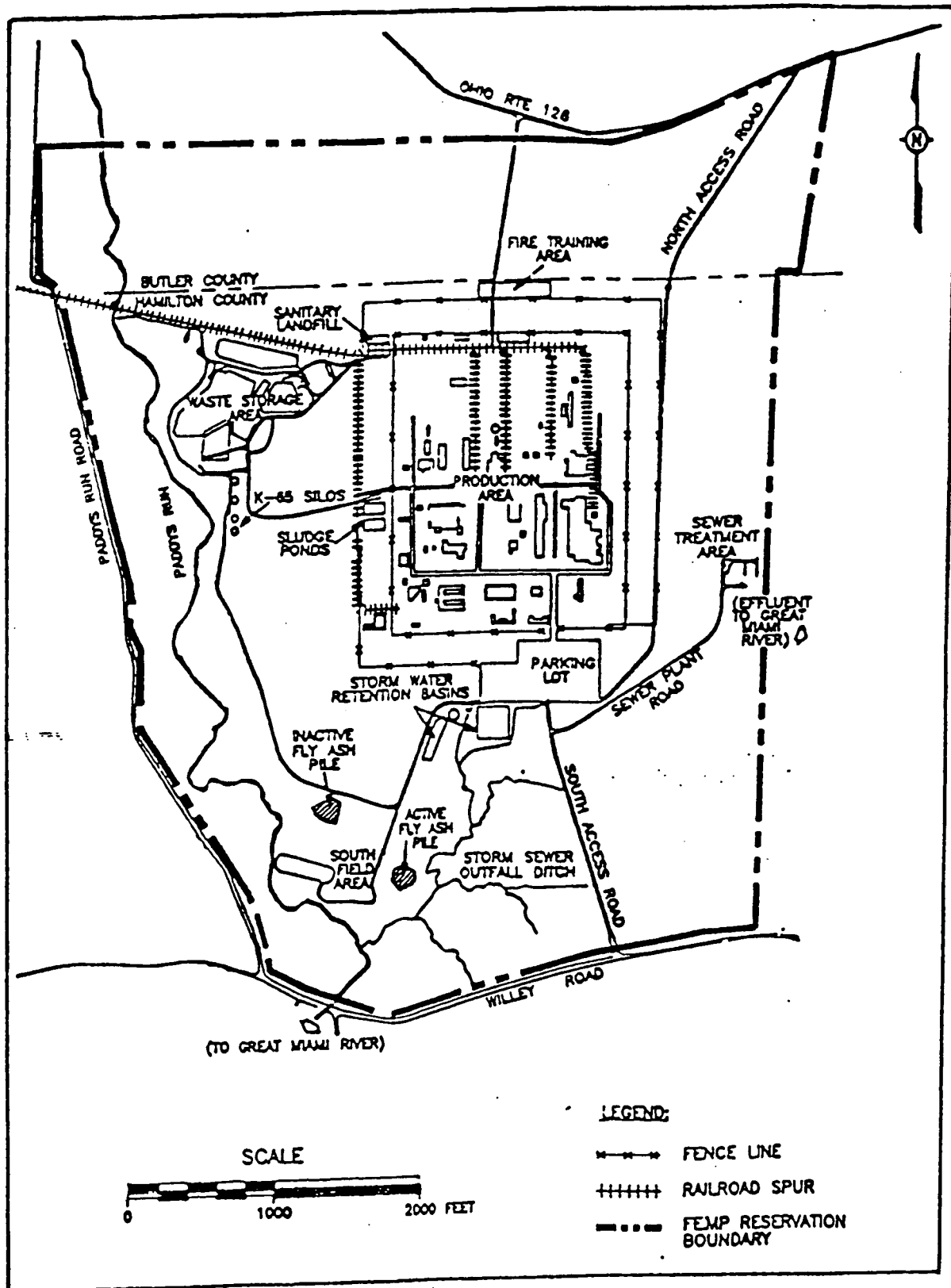
The RI/FS has been initiated to develop these remedial actions. The FEMP site has been segregated into five operable units. Operable Unit 1 (OU1) includes the waste pits, etc. which were utilized for the storage and/or disposal of radiological and chemical wastes from the on-site operations. OU1 is located in the northwestern portion of the site, west of the Production Area and north of Silos 1, 2, 3, and 4. Specifically, the Pit 5 Experimental Treatment Facility (ETF) is a component of OU1 and is located south of the access road between Pits 3 and 5, near the southwest corner of Pit 5 (Figures 1 and 2). Details of the purpose and construction of the ETF is discussed in Section 2.0.

A Removal Site Evaluation (RSE) for this action was prepared consistent with 40 CFR Part 300.410. It has been determined by DOE, the lead agency for the FEMP Comprehensive Environmental Response Compensation and Liability Act (CERCLA) actions, that a time critical removal action is necessary. This removal action will involve the removal, containerization, and storage on-site of the waste contents within the ETF including the remaining residues, the filter bed materials, and the actual ETF structure (including the liner beneath the structure). In addition to the removal of the ETF structure and its contents, the soils in the vicinity of and beneath the ETF structure will be sampled and analyzed for possible future action.

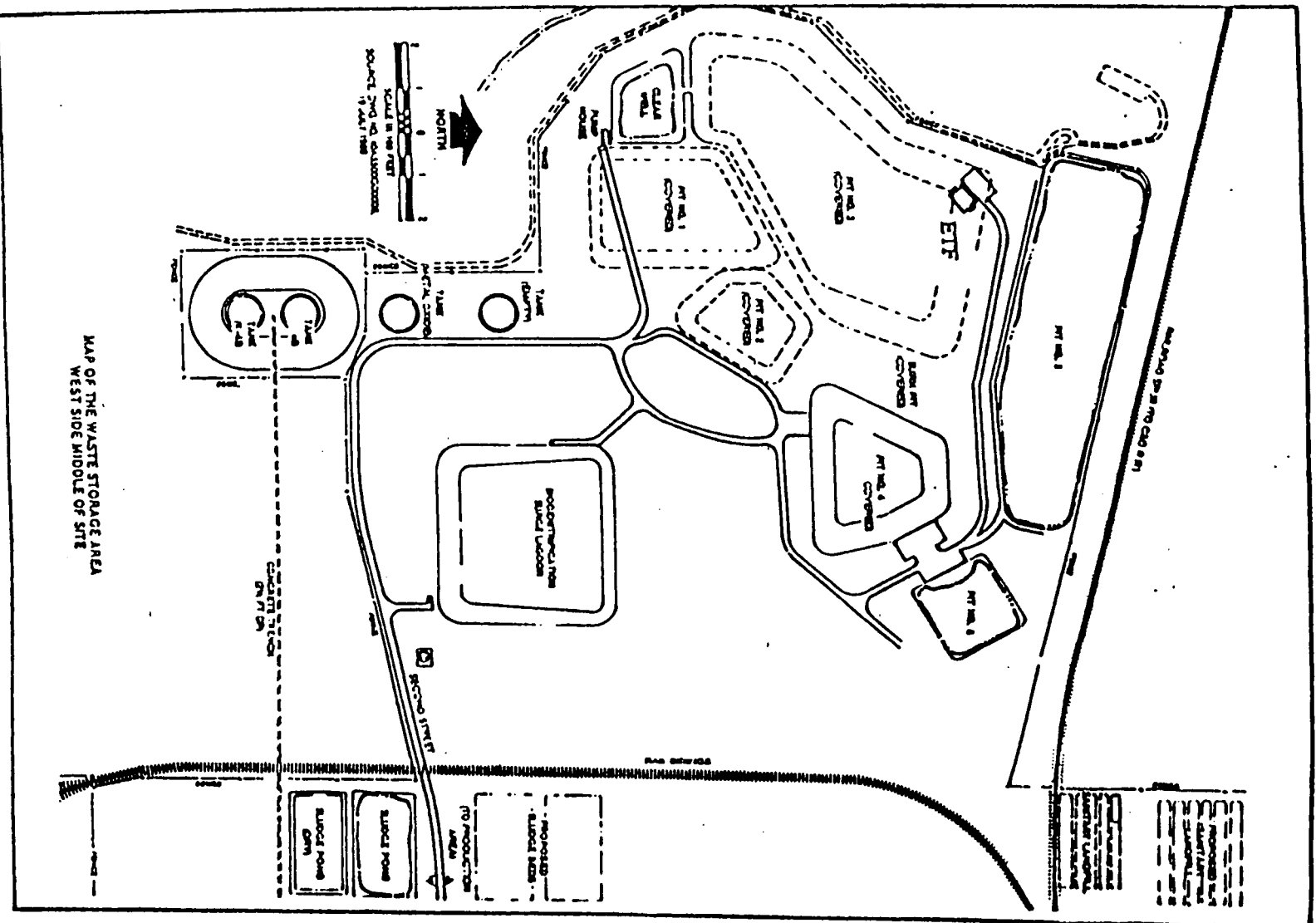
All activities performed under this work plan will follow all Applicable, Relevant, and Appropriate Requirements (ARARs) to the extent practical and meet the intent of the requirements of the National Contingency Plan (NCP). The guidance provided by the Office of Solid Waste and Emergency Response (OSWER) Directive 9360.0-03B, Superfund Removal Procedures, Rev. 3, was considered in the development of this work plan.

The Pit 5 ETF has been designated a part of the Waste Pit 5 Hazardous Waste Management Unit (HWMU) by a study conducted under the Consent Decree between the Ohio Environmental Protection Agency (OEPA) and DOE. The ETF, as part of Waste Pit 5, is included on the facility Part A Permit. Waste Pit 5 is known to have accepted wastewaters containing the RCRA listed hazardous waste 1,1,1-trichloroethane (TCA) and the sludges from Pit 5 were once processed through the ETF. According to the "Mixture Rule" in 40 CFR Part 261 which states "when one or more hazardous wastes are first added to a solid waste, that resulting mixture then becomes a hazardous waste", the ETF and its contents, are then subject to RCRA requirements.

**FIGURE 1.**  
**FEMP SITE MAP**



**FIGURE 2.**  
**OPERABLE UNIT 1 LOCATION MAP**



## 2.0 BACKGROUND

### 2.1 Summary of Potential Threat

During FEMP operations, Waste Pit 5 received liquid waste slurries from the on-site refinery and recovery plants. These liquid wastes included neutralized raffinates, settling solids, slag-leach slurries, sump slurries, lime sludges and process waters from the wastewater treatment system. In 1984 the ETF was constructed for the purpose of volume reduction for final disposition of sludges generated and accumulating in Waste Pit 5.

The entire ETF was built above ground measuring 20 feet by 48 feet. At the perimeter are retaining walls six (6) feet in height, constructed of wooden panel forms generally used in the concrete industry. The original design included a sand and gravel filter bed underlain by a plastic liner (see Figures 3 and 4). The ETF was also covered by a greenhouse type enclosure. It served to facilitate the thermal drying of the sludge. In addition, this cover provided protection from wind and precipitation.

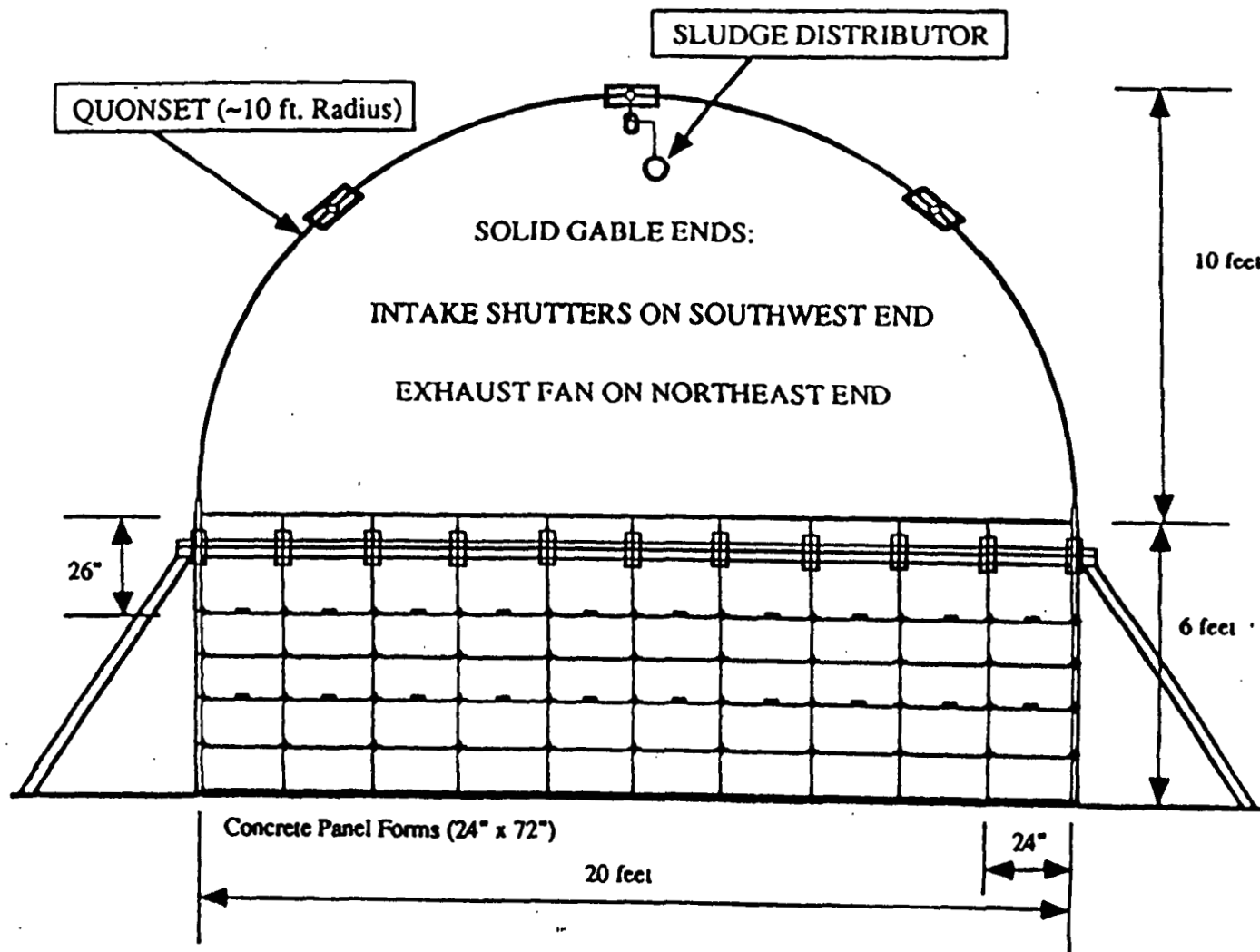
In November 1984, approximately 12000 gallons of diluted Pit 5 sludge was pumped to the ETF with the intent of dewatering. The liquids that were accumulated by this process were then pumped back into Waste Pit 5. The sludges have not been removed and remain within the ETF. This was the only volume of sludges processed through the ETF.

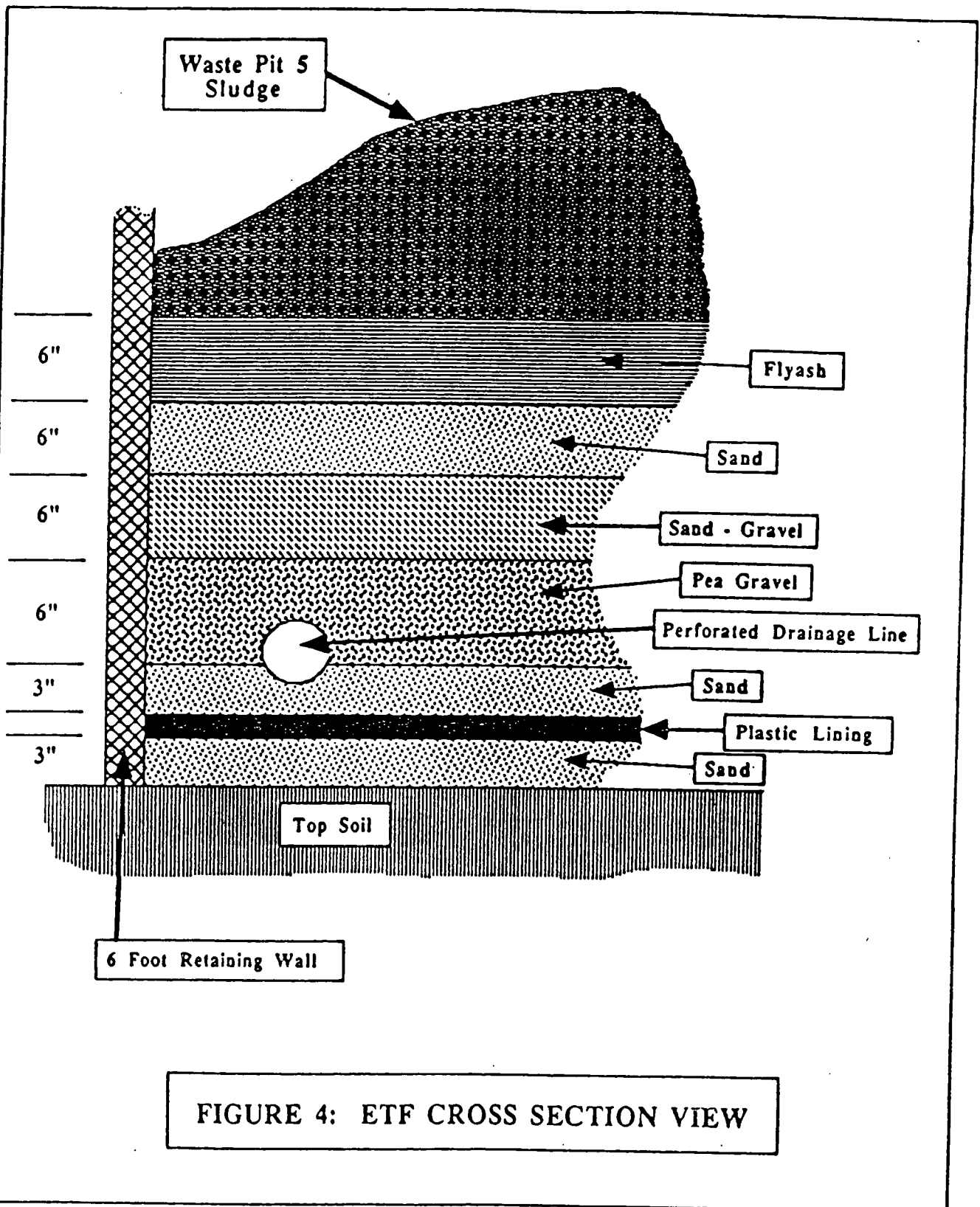
On February 23, 1988, high winds removed the plastic roof from the ETF which then contained the dry Pit 5 materials. A small amount of this material was blown out of the structure onto the surrounding soils. Interim measures were taken to minimize materials being blown out of the ETF structure. These measures included water being sprayed over the remaining residues and the placement of a tarpaulin over the ETF filter bed. This tarpaulin is being held in-place with concrete blocks.

Since the ETF structure remains in the same condition as described, there is a potential for more waste materials to be carried from the existing ETF structure. Contamination to other areas of the site through wind erosion and run-off can occur especially during severe weather, high winds, and heavy precipitation. Therefore, this time critical removal action is being performed, as directed by DOE, due to the potential for contamination to be spread outside of the ETF. In addition, this removal action has been identified as Removal Action #11 in the amended Consent Agreement executed September 1991 (Section IX (F)(1)(d)).



FIGURE 3: EXPERIMENTAL TREATMENT FACILITY (ETF) END VIEW





## 2.2 Related Actions

The Consent Agreement between the DOE and USEPA identifies the Pit 5 ETF removal action as a Phase II removal action (Removal #11). As stated in the Consent Agreement, DOE shall submit to USEPA removal action work plans, or other appropriate documentation, for review and approval. The required date of submission for this removal action work plan has been established as October 30, 1991.

It should also be identified that other related activities on-going in the Waste Pit Area (WPA) may potentially impact this removal action. These related activities include the Waste Pit Area Stormwater Run-off Control Removal Action, the Pit 5 Berm Investigation, the Waste Pit Area Radon Flux Measurements, and RCRA Compliance issues as they relate to Pit 5 and the Clearwell.

Contingencies regarding these other activities have been considered in the development of the project milestones/schedule addressed in Section 9. Project impacts that have been examined include; project scheduling; work delays; resource availability; access to the area; required documentation; and procedural and regulatory conflicts (e.g., RCRA/CERCLA integration).

## 2.3 Roles of the Participants

DOE is the lead agency for response actions at the FEMP, per the consent agreement, and will coordinate and execute this removal action.

The USEPA will review and approve this work plan.

The OEPA will participate in the review of this work plan and will provide technical guidance and informational exchanges.

Advanced Sciences Incorporated (ASI), as a contractor to DOE, is conducting the RI/FS program.

Preselected off-site laboratories will perform required analysis on an as needed basis. These laboratories include International Technology Corporation (IT), Ecotek, and Data Chem Laboratories.

Parsons Group, as a contractor to DOE, will provide conceptual and remedial design of the removal action activities.

Westinghouse Environmental Management Company of Ohio, Inc. (WEMCO), as the FEMP Management and Operating Contractor, is responsible for the implementation of this removal action in a manner consistent with DOE and regulatory guidance. Associated WEMCO Departments will oversee and direct quality assurance procedures, safety and health procedures, and necessary compliance issues.

#### 2.4 Removal Action

The Pit 5 ETF Removal Action consists of the removal, containerization, and storage on-site of the waste materials within the ETF and the ETF structure itself. These materials will be removed, containerized into drums or metal boxes, and transported to a designated on-site storage area. Vegetation surrounding the ETF will be surveyed using field instrumentation, containerized and sampled to determine final disposition. It is expected that approximately 110 cubic yards of filter media and waste residues and approximately 15 cubic yards of ETF waste debris will be generated and containerized during this removal action. Containerized wastes will be stored in the on-site RCRA storage area on the Plant 1 Pad. Final disposition of these wastes will not be performed as part of this removal action.

Soils beneath and in the vicinity of the ETF will also be sampled and analyzed to determine whether contamination exists. Contaminated soils detected around the ETF will be addressed in future removal actions or as part of the final remedial action for Operable Unit 1.

### 3.0 SUPPORT ACTIVITIES

#### 3.1 Project Planning Activities

Activities to be undertaken prior to the actual site work are; planning, scheduling, training, design and coordination of the removal tasks. These activities may include, but not be limited to the preparation of detailed tasks listing and delineating responsibilities of the various contractor and subcontractor support functions.

Such documents as the Operational Readiness Review (ORR), the Safety Assessment and the Risk Assessment will be prepared prior to the commencement of removal action activities. A Categorical Exclusion (CX) under Section 1508.4 of the National Environmental Policy Act (NEPA) has been executed.

### 3.2 Design of the Removal Action

Definitive design documents and implementing procedures will be prepared on an as needed basis to support the removal action. Typical documents may include the following:

- a. drawings and specifications to support any task specific equipment that may be required during the removal action,
- b. procedures, designs and/or specifications related to dust control and mitigating the spread of contaminants, and
- c. drawings and/or maps providing information regarding staging areas, laydown areas and/or control zones.

### 3.3 Training of Personnel

All site workers involved in the implementation of this removal action within the Waste Pit Area will have satisfied the training requirements for hazardous waste operations (cleanups involving hazardous substances: 29 CFR 1910.120). In addition, all personnel will successfully complete the required safety training sessions set forth by WEMCO including, but not limited to, radiation worker training, nuclear criticality training, respirator training and fit testing, training requirements specific to the WPA, and FEMP procedures developed and approved to implement this removal action.

### 3.4 Personnel Responsibilities

- 3.4.1 DOE Operable Unit 1 Manager has the responsibility for the removal action oversight, inspection, surveillance, and the acceptance of work being performed. Overall performance and execution of the removal action will be monitored by the DOE OU1 Manager.
- 3.4.2 WEMCO Operable Unit 1 Manager has the responsibility for all activities concerning this removal action through normal management organization structure. These activities will include, but not be limited to, tasks described in this document and the Task Specific Health and Safety Plan. All design and construction activities and/or supplemental work associated with the removal action will be reviewed and approved by the Operable Unit 1 Manager to assure consistency with the final remedial program. The WEMCO OU1 Manager also has the obligation of on-site removal action inspection and surveillance.

3.4.3 All involved personnel are responsible and accountable for verbatim compliance with this removal action work plan, the health and safety plan, any applicable procedures, and all FEMP safety policies.

3.4.4 The Field Supervisor is responsible for the following:

- Overseeing the proper implementation of this work plan,
- Promptly notifying the Assistant Emergency Duty Officer (AEDO) of abnormal or unforeseen situations,
- Maintaining a daily log of operations,
- Generating and maintaining an approved access list for the exclusion zone,
- Conducting daily pre-shift briefings for planned activities,
- Maintaining a copy of all checklists, if required, and
- Reporting progress of the removal action to the OU1 Manager.

3.4.5 All Workers are responsible for the following:

- Maintaining line-of-site contact with at least one other person while in the exclusion zone, and
- Promptly informing the field supervisor of abnormalities or unforeseen situations that may occur during the removal action.

3.4.6 Industrial Hygiene Technicians (IHT) and Radiological Safety Technicians (RST) are responsible for the following:

- Performing and documenting the required vegetation and soil surveys and air monitoring, and
- Promptly notifying the health and safety officer and field supervisor of monitoring results.

3.4.7 Health and Safety Officer is responsible for verifying compliance with the task specific health and safety plan.

## 4.0 IMPLEMENTATION OF REMOVAL ACTION

### 4.1 General

4.1.1 A daily log of operations shall be maintained by the field supervisor and must include, at a minimum, the following information:

- Date and time of field operations,
- Initial conditions at start-up, including meteorological data (e.g., wind speed and direction, temperature, weather conditions, etc),
- Names of all personnel accessing the area and duration of the access,
- Operations performed,
- Sampling performed,
- Any abnormal or unforeseen conditions, and
- Verification that all daily tasks are complete, and no defective equipment is being utilized.

4.1.2 A daily pre-shift briefing shall be conducted as required by the task specific health and safety plan.

### 4.2 Activities

4.2.1 Obtain or verify that an active work permit has been issued and perform any required initial monitoring.

4.2.2 Verify that the exclusion area and decontamination zone barriers and postings meet the requirements of the task specific health and safety plan.

4.2.3 Don all personnel protective equipment (PPE) required per the task specific health and safety plan.

- 4.2.4 It is expected that the removal action will be conducted in four (4) phases. Until all designs, specifications, and drawings, etc., have been developed for the construction/demolition of this removal action, activities identified in the following phases are expected to be performed. Modifications may be required and implemented on an as needed basis given new and/or different information. The sequence of activities for each phase identified below represents the current expected process or listing of the specified activities.
- 4.2.5 The first phase are those activities required for the removal of the vegetation from the vicinity of the ETF. This shall consist of the following:
- a. Clear sufficient area surrounding the ETF structure. This shall be performed by using appropriate equipment such as pruning shears, weed cutters, hand saws and the like, to remove required vegetative growth.
  - b. The vegetation shall be surveyed for gross alpha and gross beta contamination, segregated, and placed into appropriate containers for final disposition as required by WEMCO Site Operating Requirement (IN-6015) - "Disposition Requirements for Radiologically Contaminated and Uncontaminated Construction and Maintenance Waste".
  - c. Each container shall be closed and properly marked and labelled.
  - d. Containerized vegetation shall be stored until final disposition is determined.
- 4.2.6 The second phase of the removal action activities are to include the removal of the waste materials from within the ETF structure including the synthetic liner, liquid collection system and filter bed materials. This phase shall consist of the following activities:
- a. The end of the ETF structure will need to be removed for an egress point of equipment to be utilized to remove the ETF contents. Anticipated equipment expected to be utilized are a bobcat and a forklift for the transport of the containers. Control measures shall be installed at the end of the ETF structure to contain any spillage of waste materials when the end of the ETF is removed. These control measures include a lined and bermed area that totally encompasses the ETF



structure and thus controls the potential for run-on and run-off of liquids. The area shall contain any spillage of waste materials during the removal action activities. Diagrams showing the bermed and lined areas and the general work area will be submitted when available.

- b. Removal of the end of the ETF will be performed manually using appropriate manual tools and equipment. The wood wastes from the end section shall be in lengths that will fit into appropriate containers. If spillage of waste material occurs, that material will be manually placed into containers immediately. Each container will be closed, properly marked and labelled then transported to the RCRA storage area discussed in Section 4.2.12 below.
- c. The loading process will be conducted on the lined area to prevent waste materials from spilling onto the ground surface. Any spilled material will be placed directly into the container being loaded. Once all loading is completed, all materials utilized shall be containerized with proper markings and labels then transported to the RCRA storage area discussed in Section 4.2.12 below.
- d. The waste residues and filter bed materials will be removed from within the ETF by utilizing a bobcat or similar type equipment. The materials will be removed beginning at the end of the ETF that was removed and progress inward. The wastes will be removed down to and below the liner beneath the filter media. Once wastes have been removed to the length of reach of the bobcat across the length of the ETF, a new temporary liner will be installed to prevent contamination of the ground surface. The waste materials will be loaded into appropriate containers. Each container will be closed, properly marked and labelled, then transported to the RCRA storage area discussed in Section 4.2.12 below.
- e. Removal of miscellaneous equipment, such as PVC piping that was used for liquid collection beneath the filter bed, will also be performed during the filter bed removal. Separation of this type of waste shall also be performed and placed into separate containers from the filter bed waste. This waste shall be cut manually into lengths capable of fitting into appropriate containers. Power tools will not be utilized during the cutting of the piping therefore eliminating the generation of airborne

contaminants. General air monitoring will be conducted as identified in the Site Specific Health and Safety Plan during this removal action to document air emissions. Each container will be closed, properly marked and labelled then transported to the RCRA storage area as discussed in Section 4.2.12 below.

- f. The plastic liner beneath the filter bed will be removed and shall be placed into its own separate containers. Each container will be closed, properly marked and labelled then transported to the RCRA storage area discussed in Section 4.2.12 below.
- g. A collection sump, constructed of concrete pipe located in the northern most corner of the ETF, will be removed and placed into the appropriate container. This sump was used for the collection of dewatered liquids, where they were then pumped back into Waste Pit 5 via a portable pump and flexible hoses.
- h. Dusts generated during the removal of waste materials will be suppressed, as necessary, by water misting both the work areas and the materials being loaded into containers. Caution will be taken to prevent the production of any free standing water in either the work area or the containerized wastes. If excess waters are generated, these shall be containerized and handled as if they are hazardous wastes.
- i. Representative samples of the containerized waste shall be collected for analysis to determine final disposition.
- j. All containers being stored shall be entered into the site RCRA waste inventory record and shall be managed as hazardous wastes, in the RCRA storage area as discussed in Section 4.2.12 below.
- k. The collected samples shall be transported to the laboratory for necessary analyses.

4.2.7 The third phase of the removal action activities is the dismantling of the ETF structure. These following activities will continue to be conducted within the lined and bermed area previously discussed. This phase shall consist of the following activities:

- a. Dismantling of the wooden panel form structure will be performed manually using appropriate tools and equipment.

The lengths of the wood sections shall fit into the appropriate containers. Power tools will not be utilized during the demolition of the ETF walls therefore eliminating the generation of airborne contaminants. General air monitoring will be conducted as identified in the Site Specific Health and Safety Plan during this removal action to document air emissions. Each container will be closed, properly marked and labelled then transported to the RCRA storage area as discussed in Section 4.2.12 below.

- b. Representative samples of the containerized waste shall be collected for analysis to determine final disposition.
- c. All containers being stored shall be entered into the site RCRA waste inventory record and shall be managed as hazardous waste in the RCRA storage area as discussed in Section 4.2.12 below.
- d. Transport collected samples to the laboratory for necessary analysis.

4.2.8 The fourth phase of this removal action will be the sampling and analyses of the soils in the vicinity of and beneath the ETF structure. The collection of the samples beneath the ETF shall be conducted following the liner removal activities and before the installation of the new temporary liner. The sampling and analyses of the soils shall be in accordance with Section 5 and the Sampling and Analysis Plan. This data will be used to identify surface contamination in the immediate vicinity of the ETF structure. This data will be incorporated into the RI/FS data base.

4.2.9 All equipment utilized during the removal action shall be decontaminated prior to departing the area. Reusable equipment such as tools, respirators, etc. shall be decontaminated at the work site then transported and further decontaminated at the on-site facility. Equipment such as PPE, shall be containerized for final disposition. Decontamination methods shall be in accordance with the Health and Safety Plan. All decontamination wastes that are generated shall be containerized, sampled, and analyzed for final disposition. These containerized decontamination wastes will be handled as if they are a hazardous waste and be transported to the RCRA storage area as discussed below in Section 4.2.12.

4.2.10 At the completion of all field activities, the field supervisor, Health and Safety Officer, and IRS&T personnel, shall verify and record in all appropriate log books that:

- a. all planned work has been successfully completed,
- b. required surveys are complete,
- c. all equipment utilized meets decontamination limits, and
- d. all wastes are containerized appropriately.

4.2.11 All containers being stored shall be properly marked and labelled. Since the materials will be considered a "mixed waste", marking and labelling for radioactive materials and RCRA wastes will be implemented. The following markings and labels placed on each container shall include but not be limited to:

- Container Number.
- FMPC Lot Marking Code.
- FMPC Inventory Number.
- Reactivity Code.
- Gross, Tare, and Net Weights.
- Hazardous Waste Label which includes generator information, start accumulation date, EPA hazardous waste numbers, etc.
- Department of Transportation (DOT) Hazard Label.
- DOT Marking (ORM-E).

4.2.12 All containerized materials generated from the implementation of this removal action shall be stored in the on-site RCRA storage area located on the Plant 1 Pad. This storage area is approved for the storage of containerized "mixed wastes" and hazardous wastes. The Consent Decree and 40 CFR Part 264.170 and 265.15, and Ohio Administrative Code (OAC) 3745-65-15 and 3745-66-74, identifies specific requirements for the use and management of containers. These requirements include such items as containers kept closed, weekly inspections, etc. Since the waste materials being stored will be

a depleted radioactive waste, no additional storage criteria is required beyond the RCRA storage requirements.

## **5.0 SAMPLING AND ANALYSIS**

Sampling of materials being removed and containerized will be performed to facilitate and ensure adequate disposition of the waste materials consistent with on-site procedures, regulatory compliance and the Sampling and Analysis Plan. Sampling of the surface soils in the vicinity of and beneath where the ETF was located shall identify the presence of contamination.

Samples withdrawn from the surface will be placed into appropriate laboratory containers for analysis. All sample containers will be properly labelled and transported to the laboratory using proper chain-of-custody procedures per the RI/FS Quality Assurance Project Plan (QAPP), and USEPA Document SW-846, "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods."

Samples will be collected to a maximum depth of six inches. These samples will be collected from several locations in the vicinity of and directly beneath the ETF. Due to the ETF being located directly on top of the cover of Waste Pit 3, no samples will be collected below the six inch depth to prevent the breaching of the Waste Pit 3 cover. All sampling and analysis will be conducted in accordance with the Sampling and Analysis Plan.

Work being performed for this removal action, will be consistent with the RI/FS QAPP, and SW-846.

## **6.0 HEALTH AND SAFETY**

The work to be performed, for this removal action, will be consistent with the Health and Safety Plan. The plan recognizes, evaluates, and controls all identified safety and health hazards. In addition, it provides for emergency response for hazardous operations and decontamination procedures to be implemented. The Health and Safety Plan is consistent with 29 CFR 1910.120 and the RI/FS Health and Safety Plan. Safety documentation will be prepared according to FMPC-2116 Topical Manual "Implementing FMPC Policies and Procedures for System Safety Analysis". FMPC-2116 has been prepared to implement DOE Order 5481.1B "Safety Analysis and Review System", and DOE/OR-901 "Guidance for Preparation of Safety Analysis Reports."

## **7.0 QUALITY ASSURANCE**

The Pit 5 ETF Removal Action will be conducted in accordance with the RI/FS QAPP and the overall quality assurance program at the FEMP as described in the site Quality Assurance Plan, FMPC-2139. The Quality Assurance Plan is based on the criteria specified in ANSI/ASME NQA-1, USEPA Guideline QAMS-005.80 and DOE Orders 5700.6 and 5400.1.

The WEMCO Quality Assurance Department will also conduct periodic surveillance, inspections and/or audits to verify compliance throughout the execution of this removal action.

## **8.0 PERMITS AND REGULATORY CONSTRAINTS**

No regulatory permits are required for this removal action. However, USEPA review and approval of this work plan are required prior to commencement of the ETF removal action. Also, FEMP Work Permits will need to be secured prior to the commencement of on-site removal action activities.

## **9.0 MILESTONES/SCHEDULE**

The initiation of work is contingent upon the approval of this work plan. It is expected that all on-site removal action activities will be completed within 120 calendar days from the approval date of this work plan. These on-site removal action activities will be considered completed when all ETF waste materials, designated for removal, are containerized and the threat of release is eliminated. This schedule of 120 calendar days includes time allowances, if necessary, for adverse weather conditions. Therefore, it is anticipated, based on the required approvals of this work plan, that this removal action as described above, is scheduled for completion in March 1992.

At the completion of all removal action activities, a Removal Action Report shall be developed and submitted. This report shall include at a minimum, a discussion of all field activities, documentation of samples collected and chain of custody procedures, and all analytical results. Conclusions and/or recommendations regarding the removal action shall also be identified and discussed within this Removal Action Report.

**PIT 5  
EXPERIMENTAL TREATMENT FACILITY (ETF)  
REMOVAL ACTION**

**SAMPLING AND ANALYSIS PLAN**

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

November, 1991

## **SAMPLING AND ANALYSIS PLAN**

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### **APPENDICES**

- A. Environmental Monitoring On-site Media Sampling, Procedure Number: EM-2-013.



## **SAMPLING AND ANALYSIS PLAN**

### **PIT 5 EXPERIMENTAL TREATMENT FACILITY (ETF) REMOVAL ACTION**

#### **1.0 PURPOSE OF SAMPLING**

The purpose of this sampling and analysis plan will be to collect sufficient data to facilitate and ensure adequate disposition of the waste materials consistent with on-site procedures and regulatory compliance. Representative samples will be collected of the containerized vegetation, ETF waste contents and ETF structure. This characterization will provide the necessary data needed for the preparation of appropriate removal, containerization, storage, and final disposition of the waste materials generated by the performance of this removal action.

In addition to sampling as discussed above, surface soils will be sampled beneath and in the vicinity of the ETF structure. This data may provide information regarding the affects of the ETF on the surrounding environment. However, data interpretation will be very difficult to differentiate whether the presence of contamination, if detected, is attributable to the ETF or Waste Pit 3, since the ETF is directly located on the cover of Waste Pit 3.

Data generated from this sampling of soils will be utilized and incorporated into the RI/FS database. Results obtained from this sampling effort will be compared to available background data in the vicinity of the site.

#### **2.0 SAMPLING AND ANALYSIS**

##### **2.1 General**

2.1.1 All information pertinent to the field sampling shall be recorded in a field log book. This log book shall include, at a minimum, the following information:

- Name and address of field contact.
- Producer of waste and address, if different from location.
- Purpose of sampling.
- Locations of sampling points.
- Type of process producing waste, if known.
- Description of sampling points and sampling methodologies.
- Suspected waste composition, including concentrations.
- Type of waste being sampled.
- Sample numbers and volumes collected.
- Date and time of sample collection.

- Collectors sample identification number.
- Data of any field measurements performed at the sampling locations.
- Field observations.
- Prevailing weather conditions.
- Sample distribution and transport modes.
- References, such as maps or photographs of the sampling sites.
- Signatures of personnel responsible for observations.

Field conditions and sampling situations vary widely. The above information, plus any other details or data, will be recorded in the field log book.

2.1.2 All samples being collected shall have the following information recorded on a label attached to the appropriate sample container:

- Sample number.
- Name of collector.
- Date and time of sample collection.
- Location of sample collection.

All sample containers shall be sealed with evidence tape to detect any unauthorized tampering of the samples, following sample collection to the time of analysis. The same information identified above must also be recorded on this evidence tape. The tape must be attached in such a way that it is necessary to break the seal in order to open the sample container. Seals must be affixed to the sample container before the sample leaves the custody of sampling personnel. These requirements are consistent with EPA Document SW-846, "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods."

All samples being transported to the laboratory for analysis shall be accompanied by the required Analysis Request/Custody Record form in accordance with Environmental Monitoring Section (EM) procedures, "Environmental Monitoring On-site Media Sampling", EM-2-013.

2.1.3 All activities performed as part of this sampling and analysis plan shall be conducted in accordance with, at a minimum, the following:

- a. RI/FS Quality Assurance Project Plan (QAPP), and

- b. EPA Document SW-846, "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods.

## 2.2 Sampling

### 2.2.1 Pre-construction

The vegetation surrounding the ETF will be surveyed initially for radiological contamination. The surveying shall begin from the north end, since this is the end of the ETF being removed, and progress inward toward the ETF structure. As surveying progresses, the vegetation shall be segregated between radiologically contaminated and non-contaminated materials in accordance with WEMCO Site Operating Requirement (IN-6015) - "Disposition Requirements for Radiologically Contaminated and Uncontaminated Construction and Maintenance Waste." Only vegetation that may be an obstruction to the removal action activities will be surveyed, removed, and containerized, if necessary.

Vegetation shall be segregated and placed into containers to be prepared for storage on-site. Representative samples shall be collected from these containers for analysis to determine final disposition.

Field surveying equipment to be utilized for the vegetation survey shall include, but not be limited to:

- Field Instrument Detector for Low Energy Radiation (FIDLER) gamma scintillator,
- Thin window geiger-mueller pancake detectors, and
- Alpha Scintillation Counters.

### 2.2.2 During Construction

During the removal action, representative samples of wastes being containerized shall be collected from the containers. Representative sampling shall consist of the collection of grab samples from the waste materials as they are being containerized. The goal of representative sampling is to obtain a sample of the materials that exhibits the average properties of those materials. Therefore, samples shall be collected of each of the filter materials and composited into samples representative of the entire waste materials. It is estimated that five composited samples will be collected for final disposition analysis. Also, as the waste materials are being loaded into the containers, field measurements for radiological contamination will be conducted. These

measurements may be used for marking and labelling of the containers.

There will be four (4) soil samples collected from beneath the ETF structure. These samples will be collected as the wastes are removed from within the structure. As soon as the ground surface is exposed at the identified sample location determined using SW-846, soil samples shall be collected as soon thereafter as possible. Soil samples will be collected from a depth not to exceed six inches thereby preventing the breaching of the cap of Waste Pit 3.

The wood that comprises the ETF structure will be sampled for final disposition analysis. Several random locations of the wooden walls will be sampled to obtain a representative sample to be analyzed for final disposition analysis. This sampling will include a cross section of the wood walls to indicate the penetration of waste constituents into the wood grain. This sampling shall occur following the removal of the waste from within the structure. Samples collected will be sent to the laboratory for analysis for radiological and non-radiological constituents for final disposition as listed below in Section 2.3.

#### 2.2.3 Post-construction

When the vegetation and the ETF structure have been cleared from the area, sampling of the soils in the vicinity of where the ETF structure was located, will be performed. There will be four (4) locations where soils will be sampled outside the perimeter of where the ETF structure was located. These samples will be collected to a depth not to exceed six (6) inches to prevent breaching the Waste Pit 3 cap. The number of soil samples and the sampling locations have been selected using methodologies included in SW-846 following the approach for random sampling.

Soil samples withdrawn from the surface will be immediately placed into appropriate laboratory containers for analysis. For samples being analyzed for 1,1,1-trichloroethane, it is critical to perform the sampling as quickly as possible due to the compounds volatility. Therefore, the sample shall be immediately placed into a container for volatile organic analysis (VOC Vial), sealed as quickly as possible and placed into coolers retaining temperatures of approximately four (4) degrees Centigrade. Each sample will be labelled appropriately with its project name, sample number, sample depth, and date and time of collection. All samples will be transported to the appropriate laboratory using proper chain-of-custody procedures. All field information will be recorded in the field log book as discussed above.

### 2.2.4 Sample Matrices

Below is a table of expected samples and analysis to be conducted during this removal action.

<u>Media</u>	<u>Analysis</u>	<u># of samples</u>	<u>QC Field</u>	<u>QC Lab</u>
Vegetation	Full Rad.	2	1	1
Soils	Full Rad.	8	1	1
	TCA	8	1	1
Wastes	Full Rad.	5	1	1
	TCLP	5	1	1

## 2.3 Analysis

### 2.3.1 Analytical Parameters

Since the ETF is located on the cap of Waste Pit 3 as discussed above, soil samples being collected beneath and in the vicinity of the ETF shall be analyzed for Full Radiological constituents and 1,1,1-Trichloroethane (TCA).

Samples collected from the waste materials being containerized shall be analyzed for final dispositional purposes only. These analyses shall include total Uranium, total Thorium, and Toxicity Characteristic Leaching Procedure (TCLP) constituents.

Analyses shall be conducted by the FEMP analytical department. Any sample analysis that cannot be performed by the FEMP analytical department shall be shipped off-site to an appropriate laboratory for the completion of analysis. Steps will be taken in the field to separate the samples from those being analyzed on-site versus those to be analyzed at an off-site laboratory. All analyses will be performed in accordance with EPA Contract Laboratory Program (CLP) protocols and EPA document SW-846, "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods".

### 2.3.2 Container Requirements

Container requirements, weighted volumetric specifications, and holding times for the suggested analyses are as identified below. The holding times indicated are from sample collection in the field to sample extraction in the laboratory.

<u>PARAMETER</u>	<u>VOLUME</u>	<u>CONTAINER</u>	<u>HOLDING TIMES</u>
Full Radiological	200 grams	glass/polyethylene	180 days
1,1,1-Trichloroethane	(2)-40ml vials	glass	7 days
TCLP Metals	1 pint	glass/polyethylene	180 days*
TCLP Volatiles	(2)-40ml vials	glass	14 days
TCLP Semi-volatiles	1 pint	glass	7 days
TCLP Pest/Herbs	1 pint	glass	7 days

\* Holding times for mercury analysis shall not exceed 28 days.

## 3.0 QA/QC SAMPLING REQUIREMENTS

Environmental monitoring will be conducted in accordance with the RI/FS QAPP. Environmental Monitoring Section (EM) procedures, "Environmental Monitoring On-site Media Sampling", EM-2-013, conforms to the QAPP for trip blanks, field blanks, and duplicate samples. One field/trip blank per sampling event or twenty samples, which ever is greater, will be taken and accompany the collected samples to the laboratory. Regardless of sample matrix, a duplicate sample of every tenth sample shall be collected for analysis. These samples will be noted in the field log book as applicable to the specific project. All duplicate or QA/QC samples will be contained, sealed, and labeled in such a way that the receiving laboratory will not know that the sample is a duplicate.

Analytical data quality levels of III and IV will be attempted for disposition analysis and soil samples collected beneath and in the vicinity of the ETF respectively.

## 4.0 EQUIPMENT

At a minimum, the required equipment and associated forms will be those listed in WEMCO Environmental Monitoring procedure EM-2-013. Equipment expected to be utilized during the sampling shall include but not limited to the equipment specified in methodologies EM-EXM-90-001 and EM-EXM-90-006. The list of equipment and forms may be added to or deleted from as directed by the needs of the specific portion of the project.

## **5.0 DECONTAMINATION OF EQUIPMENT**

All equipment used during the sampling, will be decontaminated pursuant to WEMCO Environmental Monitoring procedures EM-2-013 and the Health and Safety Plan. Decontamination of the equipment will be performed following each sampling location. In accordance with EPA document SW-846 and Environmental Monitoring procedure EM-2-013, a final rinsate sample shall accompany all sampling conducted in the support of this project to confirm that contamination is not being transported to other sampling locations. Wastes generated from the decontamination process shall be containerized into drums. At project completion, a representative sample shall be collected from the drummed liquids for appropriate laboratory analysis.

## **6.0 METHODOLOGY OF SOIL EXTRACTION**

Methodologies to be utilized for the sampling of environmental media shall include but not be limited to the following:

- a. Environmental Media Sampling Extraction Methodology for Using a Stainless Steel Auger and a Stainless Steel Scoop, EM-EXM-90-001,
- b. Environmental Media Sampling Extraction Methodology Using the JMC Environmentalist Subsoil Probe, EM-EXM-90-006.



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DOCUMENT APPROVAL

PROCEDURE SECTION: IMPLEMENTATION

PROCEDURE TITLE: ENVIRONMENTAL MONITORING  
ON-SITE MEDIA SAMPLING

PROCEDURE NO.: EM-2-013

**CONTROLLED COPY**

PREPARED BY: L. Hall  
AUTHOR

8/15/90  
DATE

APPROVED BY: *B. D. [Signature]*  
SUB-SECTION MANAGER

                      
DATE

AUTHORIZED BY: *[Signature]*  
MANAGER, ENV. MONITORING

8/15/90  
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### 1.0 PURPOSE

To assign responsibilities and establish the procedure for the collection of media samples in support of the Environmental Monitoring program.

### 2.0 SCOPE

This procedure identifies the methods and equipment to be employed for collecting media samples for analysis, data review, reporting and record keeping.

### 3.0 DEFINITIONS

3.1 EM - Environmental Monitoring - a section within the Environmental Management Department.

3.2 EC & S - Environmental Characterization & Surveillance - a subsection within EM.

3.3 EM Techs - Environmental Monitoring technicians.

3.4 Environmental Media Sampling Request - (Attachment A) Document completed by the Project Engineer to request sampling.

3.5 Environmental Media - All physical materials that may be disturbed or removed by any phase of construction or removal projects.

3.6 Sampling Plan - (Attachment H) All necessary information and instructions, developed by the Environmental Characterization & Surveillance group, needed to complete a specific sampling task.

Note: The sample plan (Attachment H) shall include as a minimum; number of sample points, number of samples per sampling point, depth of samples, equipment description, purpose of sampling, analysis required, matrix and volume of field blanks, and type(s) of sample containers. The sample plan should be reviewed by the analytical department prior to issuance.

3.7 Project Work Packet - (Attachment B) A generic outline of sampling requirements given to EM Techs as a sample site guideline to accomplish work.

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3.8 Field Blank - A specified volume of deionized water taken to the field to rinse equipment as a QA/QC check.

3.9 Trip Blank - A specified sealed volume of deionized water taken to the field to determine the validity of clean sample containers.

### 4.0 RESPONSIBILITIES

4.1 The manager(s) of personnel required to preform work per this procedure shall ensure that affected personnel are informed or trained to the extent necessary prior to initiation of that work.

4.2 The manager of EC&S shall be responsible for the environmental media sampling program.

4.3 The EM engineer/technologist shall co-ordinate the efforts of the parties involved in the specific sampling project.

4.4 The EM Senior Technician shall issue the Project Work Packet, coordinate field efforts, and conduct post and pre inspections of sampling sites.

4.5 EM technicians shall be responsible for the sampling, per this procedure and the specific sampling plan.

### 5.0 GENERAL

All analysis to be performed at off-site laboratories shall be accomplished in accordance with WMCO laboratory subcontracts.

### 6.0 PROCEDURE

#### 6.1 Requests for Media Sampling

6.1.1 All media sampling activities shall be requested via a completed Media Sampling Request form (Attachment A) and submitted to the manager of EC & S.

6.1.2 The manager of EC & S or designee shall log the request, assign it a number and ensure that all applicable information and attachments are included.

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6.1.3 The EM Engineer/Technologist shall review all documents to insure they are technically correct, determine specific/unique equipment needs, schedule the sampling and track its progress.

6.1.4 The EM Senior Technician shall prepare a Project Work Packet (Attachment B) and assign a sampling team to conduct the work.

**6.2 Media Sampling Requirements**


6.2.1 The assigned sampling team shall review the Project Work Packet (Attachment B) and direct to the Senior Technician any questions concerning the information provided.

6.2.2 The specific sample site will be established by the sampling team by locating the sample points and marking them with an engineer pin flag or a 3x5 inch piece of yellow tape marked with the following information: date, project, sample point number and project contact/phone. Prior to any sampling being conducted the project site will be inspected by the Senior Technician to insure compliance with the sample request.

6.2.3 When departing for the sample site to conduct sampling, a trip blank and a field blank (when required), will be placed in the sample container. The matrix and volume of the field blank will be specified in the sampling plan and/or the project work packet. After sampling the specified location the equipment will be rinsed into a stainless steel pan using the field blank. Upon completion of this rinse, the field blank will be transferred to the original container. After completion of the project or daily sampling the trip blank and the field blank shall be turned in for analysis with the project samples.

6.2.4 Sampling of points located outdoors will not be conducted during precipitation or after an extended wet period.

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 <b>Westinghouse</b> Materials Company of Ohio	<b>PROCEDURE CHANGE NOTICE</b>	<b>ENVIRONMENTAL MONITORING SECTION PROCEDURE</b>
<b>PCN NO.:</b> PCN-EM-2-013-0-01	<b>PROCEDURE TITLE:</b> EM-2-013 Environmental On-Site Media	<b>EFFECTIVE DATE:</b> 09/07/90 2502
<b>AUTHORIZED BY:</b> (MANAGER, ENVIRONMENTAL MONITORING) L. S. England <i>[Signature]</i>		<b>PAGE</b> <u>1</u> <b>OF</b> <u>1</u>
<p><b>PREVIOUS REQUIREMENTS:</b></p> <p>6.2.8 An Analytical Data Sheet shall be completed (Attachment E) along with a Custody Transfer Record form (Attachment F)</p> <hr/> <p>8.0 ATTACHMENTS</p> <p>8.5 Attachment E, Analysis Data Sheet</p> <p>8.6 Attachment F, Custody Transfer Record form</p> <hr/> <p style="text-align: right;">CONTROLLED COPY</p>		
<p><b>NEW REQUIREMENTS:</b></p> <p>6.2.8 An Analysis Request/Custody Record form (Attachment E) shall be completed by entering the required sample information.</p> <hr/> <p>8.0 ATTACHMENTS</p> <p>8.5 Attachment E, Analysis Request/Custody Record (Attached)</p> <p>8.6 Attachment F, Reserved</p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>		



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- 6.2.5 Establish a decontamination line as is directed in paragraph 1.1 of Attachment C.
- 6.2.6 After obtaining each sample, as per the sampling plan, the sample shall be placed in the appropriate sample container and labeled (Attachment D) with the following information: number, date, time, project, technicians, equipment used, depth, sample point number, and lot marking code.
- 6.2.7 Each container shall be closed and a tamper proof tape placed securely over the container opening.
- 6.2.8 An Analytical Data Sheet shall be completed (Attachment E) along with a Custody Transfer Record form. (Attachment F)
- 6.2.9 Equipment shall be cleaned and decontaminated in accordance with Attachment C.
- 6.2.10 Proceed to the next sampling location and repeat steps 6.2.6 to 6.2.8.
- 6.2.11 The sample team shall maintain an official logbook of all sampling activities (Attachment G). Observations of the field conditions, equipment used, sample plan followed and team members involved are recorded for each day's sampling. This logbook will be bound and all data must be recorded in ink. The logbook will be maintained by lead EM Tech and signed by all EM Techs present during sampling.
- 6.2.12 When project sampling or daily sampling has been completed deliver the samples along with their respective Analytical Data Sheet and Custody Transfer Record to the analytical laboratory identified in the sampling plan.
- 6.3 A duplicate sample will be taken and submitted for analysis (as an internal QA/QC check) every tenth sample regardless of matrix.

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6.4 EM engineers/technologist shall ensure that a copy of each request, sample plan, data sheet and other applicable data is retained in the environmental monitoring files.

6.5 Originals of each Analytical Data Sheet and Custody Transfer Record shall be retained and stored in accordance with current DOE records management criteria.

6.6 Media Sampling Equipment

6.6.1 Equipment shall be determined during the project walk down and listed in the Sampling Plan (Attachment H) and Project Work Packet (Attachment B).

6.6.2 The proper use of equipment and method of sample extraction shall be described in the sampling plan.

6.6.3 As a minimum the following list of equipment is needed to initiate work on a sampling project:

- Containers suitable for containing samples.
- Stainless steel buckets.
- Hand-held sprayers containing distilled water and bio-degradable cleaning solution.
- Clean plastic sheeting.
- Disposable surgical gloves.
- Suitable field/duffel bag used for transporting tools and/or supplies.
- Waterproof marking pen, lab tissues, gum labels.
- Security tape.
- Waterproof field logbook.
- 100 meter (M)-tape.

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**7.0 APPLICABLE DOCUMENTS**

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- 7.1 ASTM standard methods C998, C999, C1000, D1193, D3084, D3648, E380.
- 7.2 EPA 600/4 83-020, EPA 600/4 84-043, SW 846.
- 7.3 OSH-P-52-013, Chain-of-Custody for environmental sampling
- 7.4 Environmental Media Health and Safety Sampling Program.
- 7.5 FMPC-720.

**8.0 ATTACHMENTS**

- 9.1 Attachment A, Media Sampling Request & Soil Penetration Permit.
- 9.2 Attachment B, Project Work Packet
- 9.3 Attachment C, Equipment Cleaning.
- 9.4 Attachment D, Sample Label.
- 9.5 Attachment E, Analytical Data Sheet.
- 9.6 Attachment F, Custody Transfer Record form.
- 9.7 Attachment G, Logbook Example Sheet.
- 9.8 Attachment H, Sampling Plan Outline.



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Attachment A  
Media Sampling Request  
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ENVIRONMENTAL MEDIA SAMPLING REQUEST	
<i>(TO BE COMPLETED BY THE PROJECT ENGINEER/MANAGER)</i>	
Project Name: _____	Project #: _____
Requester: _____	Phone #: _____
PE/PM: _____	Phone #: _____
Field Contact: _____	Phone #: _____
Charge #: _____	
Date of Radiological Survey (Attached): _____	
Date of Industrial Hygiene Survey (Attached): _____	
Purpose of Sampling (e.g. Preliminary, RCRA, RI/FS, Closure, etc.): _____	
Location of Samples (Attach maps, drawing, surveys and/or blueprints): _____	
<i>(ATTACH RADIOLOGICAL &amp; INDUSTRIAL HYGIENE SURVEYS)</i>	
Sample Matrix: SOIL <input type="checkbox"/> LIQUID <input type="checkbox"/> OTHER _____	
Soil Depth: SURFACE <input type="checkbox"/> 1' <input type="checkbox"/> 2' <input type="checkbox"/> 3' <input type="checkbox"/> 4' <input type="checkbox"/> 5' <input type="checkbox"/> OTHER _____	
Analysis Required:	
<input type="checkbox"/> TOTAL - (U _____ Th _____ Pb _____)	Requested Completion Date: _____
<input type="checkbox"/> ISOTOPIC - (U _____ Th _____ Pu _____ Ra _____)	
<input type="checkbox"/> TCLP - (Organic _____ Inorganic _____ Metal _____)	Is a CLP Lab Required: YES <input type="checkbox"/> NO <input type="checkbox"/>
<input type="checkbox"/> pCi/g - (Calculated) (Th _____ U _____)	
<input type="checkbox"/> OTHER _____	EPA Notification Required: YES <input type="checkbox"/> NO <input type="checkbox"/>
Special Instructions: _____	
Requester Signature: _____ Date: _____	
<i>(TO BE COMPLETED BY THE ENVIRONMENTAL MEDIA SAMPLING)</i>	
Date Sampling Request Received: _____	SAMPLE REQUEST #: _____
Radiological & Hygiene Surveys and Penetration Permits Completed & Attached: YES <input type="checkbox"/> NOT REQ <input type="checkbox"/>	
Sampling Plan Completed and Attached: YES <input type="checkbox"/> NOT REQ <input type="checkbox"/>	
Scheduled Start Date: _____	
Scheduled EPA Notification Date: _____	
Scheduled Completion Date: _____	
CONCURRENCE	
Waste Technology: _____	Date: _____
Solid Waste Compliance: _____	Date: _____
Environmental Monitoring: _____	Date: _____

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Attachment A  
Soil Sampling Penetration  
Permit  
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**MEDIA CHARACTERIZATION & SURVEILLANCE  
SOIL SAMPLING PENETRATION PERMIT**

Issued to: \_\_\_\_\_ Date: \_\_\_\_\_  
Permit #: \_\_\_\_\_ Location/Grid#: \_\_\_\_\_

Project Title/#: \_\_\_\_\_

Scope of work: \_\_\_\_\_

(depth of sampling, type of equipment to be used)

Drawings: \_\_\_\_\_  
(attach maps, drawings, and/or blueprints)

Industrial Safety Remarks: \_\_\_\_\_

Signature: \_\_\_\_\_ Ext. # \_\_\_\_\_ Date: \_\_\_\_\_

Health Physic remarks: \_\_\_\_\_

Signature: \_\_\_\_\_ Ext. # \_\_\_\_\_ Date: \_\_\_\_\_

Utility Engineer remarks: \_\_\_\_\_

Signature: \_\_\_\_\_ Ext. # \_\_\_\_\_ Date: \_\_\_\_\_

This permit is issued on the basis of available information and may not be a complete description of all obstructions. Stop work immediately and contact UE and PE/PM if obstructions other than indicated are found.

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Attachment B  
Project Work Packet  
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### PROJECT WORK PLAN

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Project Name/ #: \_\_\_\_\_  
Field Contact/Ext: \_\_\_\_\_  
Charge #: \_\_\_\_\_

Sample Matrix: \_\_\_\_\_  
\_\_\_\_\_

Methodology: \_\_\_\_\_

Equipment: \_\_\_\_\_  
\_\_\_\_\_

Field Blank: ☐ Yes ☐ No  
                  \_\_\_\_\_ Matrix  
                  \_\_\_\_\_ Volume  
                  \_\_\_\_\_ Container

Trip Blank: ☐ Yes ☐ No  
                  \_\_\_\_\_ Matrix  
                  \_\_\_\_\_ Volume  
                  \_\_\_\_\_ Container

Total Sample Points: \_\_\_\_  
Total Samples Per Point: \_\_\_\_  
Total Samples: \_\_\_\_  
Duplicate Samples: ☐ Yes ☐ No

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Attachment B  
Project Work Packet  
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[illegible]

\* Indicates duplicate sample requirement.



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Attachment C  
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**1.0 EQUIPMENT CLEANING/DECONTAMINATION**

**1.1 Decontamination Line Set Up**

The decontamination line will consist of two stages:  
the initial stage and final stage.

1.1.1 The initial stage will consist of two points with stainless steel buckets placed 5 feet apart on a clean plastic sheet, a dedicated portable pressure sprayer filled with distilled water, and a dedicated polyethylene brush for each bucket. The clean plastic sheet must extend at least 5 feet from the second point to allow laydown of equipment prior to the final stage.

1.1.2 The final stage will consist of one stainless steel bucket place on a clean plastic sheet, and a dedicated portable pressure sprayer filled with deionized water. The clean plastic sheet will be located 5 feet from the end of the initial stage.

**1.2 Initial Stage Cleaning**

1.2.2 The first point designated as the primary wash station, will consist of a stainless steel bucket containing distilled water and a bio-degradable cleaning solution, a dedicated brush, and a hand held sprayer containing distilled water. The technician wearing dedicated initial stage nitrile gloves will thoroughly scrub all equipment at this point to remove any residual material that has not been previously removed from the sampling equipment prior to cleaning. After cleaning, a thorough visual inspection of said equipment will be performed. If residual material is still present, the above procedure will be repeated. When all visual material has been removed, the technician will raise the equipment slightly above the level of water in the stainless steel bucket provided and spray

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Attachment C  
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rinse. The equipment will then be hand carried to point two.

- 1.2.3 The second point designated as the secondary wash station, will consist of a stainless steel bucket containing distilled water and a bio-degradable cleaning solution, a dedicated brush, and a sprayer containing distilled water. The technician wearing dedicated nitrile gloves will again thoroughly scrub all equipment at this point. As cleaning is completed, the technician will raise the equipment slightly above the level of water in the stainless steel bucket provided and spray rinse.

**1.3 Transition Between Stages**

- 1.3.1 When initial stage cleaning has been completed the equipment will be placed on the clean plastic sheet located at the end of the initial stage
- 1.3.3 The technician wearing final stage nitrile gloves will hand carry equipment to the final stage side.

**1.4 Final Stage Rinse**

The final stage will consist of one point with a stainless steel bucket placed on clean plastic sheeting, a hand held sprayer, distilled water, and designated clean side nitrile gloves.

- 1.4.1 This point will be designated as the final stage clean rinse and will be located at least 5 feet from the end of the initial stage cleaning. The technician wearing dedicated nitrile gloves will lower the equipment into the stainless steel bucket above the level of water and spray/rinse until enough sample is



Westinghouse  
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of Ohio

**ENVIRONMENTAL MONITORING  
SECTION PROCEDURES**

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REV NO.

TITLE: ENVIRONMENTAL  
ON-SITE MEDIA SAMPLING

PROC. NO.:  
EM-2-013

DATE:  
08/15/90

2502

Attachment C  
Page 3 of 3

collected. A final rinseate sample will be collected at the end of each day or completion of sampling project for laboratory analysis. The specified volume will be included in the sample plan.

- 1.4.2 As each piece of sampling equipment has been deionized, the technician wearing dedicated clean side gloves will hand dry equipment using lab tissues. If equipment is not needed immediately cover with clean plastic sheeting until needed.
- 1.4.3 All solid waste material generated from sampling and decontamination will be placed in a properly marked 55 gallon drum lined with a polypropylene bag. The drum will be located at a predetermined location and moved as needed.



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**ENVIRONMENTAL MONITORING  
SECTION PROCEDURES**

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REV NO.

TITLE: ENVIRONMENTAL  
ON-SITE MEDIA SAMPLING

PROC. NO.:  
EM-2-013

DATE:  
08/15/90

2502  
Attachment D  
Sample Label

DATE:  
PROJ:

TIME:

TECHS:

EQUIP:  
SAMPLE PT:  
LOT MARKING CODE#:

DEPTH:  
EM#: 0000

46

**TITLE ENVIRONMENTAL  
ON-SITE MEDIA SAMPLING**

2502  
Attachment E  
Analytical Data Sheet

## 24

- (4) Chain of Custody: Y  
(5) Priority: \_\_\_\_\_ (1,2,3)  
(6) Deadline Date: \_\_\_\_\_ (for results)  
(10) Charge (Account #): \_\_\_\_\_  
(16) Sample Matrix: \_\_\_\_\_  
(18) Sampled By: \_\_\_\_\_  
(23) Est. Disposal Date: \_\_\_\_\_

119) Date/Time Recd. \_\_\_\_\_ (In Lab.)

[illegible]

(X) **Analyses Requested:** (Also Circle Correct Isotopes And Units Where Applicable)

\_\_\_\_\_ Total U, XRF method (ppm)  
 \_\_\_\_\_ Total Th, XRF method (ppm)  
 \_\_\_\_\_ Dual./Semi- Quant., XRF method, (Rel. U. %)  
 \_\_\_\_\_ U-234, U-235, U-236, U-238 (Uth, U Basis)  
 \_\_\_\_\_ U pCi/g (Calculated)  
 \_\_\_\_\_ Th-230 (d/m-g) (pCi/g)  
 \_\_\_\_\_ Th pCi/g (Calculated)  
 \_\_\_\_\_ EP Tox. (As,Ba,Cd,Cr,Pb,Hg,Se,Aq)

Re-276 (d/e-g) (pCi/g)  
Re-278 (d/e-g) (pCi/g)  
Pu-238,239, tot. (d/e-g) (pCi/g)



# WESTINGHOUSE MATERIALS COMPANY OF OHIO

P.O. BOX 398704, CINCINNATI, OHIO 45239-8704

## ANALYSIS REQUEST / CUSTODY RECORD

PROJECT:			CLIENT:			TECHNICIAN/EXT.:			
PROJECT #:			CLIENT CONTACT:			CHARGE #:			
PE/PM:			PHONE:			LOT MARK CODE:			
SAMPLE IDENTIFICATION							ANALYSIS REQUESTED		
SAMPLE NUMBER	CUSTOMER NUMBER	DESCRIPTION	MATRIX	DATE/TIME COLLECTED	CONTAINER/ PRESERVATIVE	# CONT/ VOLUME	<u>TOTAL:</u> _U _Th <u>ISOTOPIC:</u> (Wt%,U Basis/pCi/g) _U _234 _235 _236 _238 _Th _228 _230 _Ra _226 _228 _Pu _238 _239 <u>pCi/g (Calculated):</u> _U _Th <u>ICLP:</u> _Metal _Organic _Inorganic <u>OTHER:</u>  <u>REMARKS:</u>  		
ITEM/REASON	RELINQUISHED BY	RECEIVED BY	DATE	TIME	ITEM/REASON	RELINQUISHED BY	RECEIVED BY	DATE	TIME

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2502



Westinghouse  
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**ENVIRONMENTAL MONITORING  
SECTION PROCEDURES**

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REV NO.

TITLE: ENVIRONMENTAL  
ON-SITE MEDIA SAMPLING

PROC. NO.:  
EM-2-013

DATE:  
08/15/90

2502

Attachment G  
Logbook Example

**FIELD LOG BOOK ENTRY LINES**

1. Location of sampling point
2. Name and telephone number and address of field contact.
3. Producer of waste and address.
4. Type process producing waste.
5. Type of waste.
6. Suspected waste composition and concentration.
7. Weather conditions.
8. Purpose of sampling.
9. Description of sampling point and sampling methodology.
10. Date and time of collection.
11. Number and volume of samples taken.
12. References.
13. Sample identification numbers.
14. Sample description and transportation method.
15. Field measurements.
16. Names of sample technicians.
17. Signatures of sample technicians.
18. Field observations.

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Materials Company  
of Ohio

## ENVIRONMENTAL MONITORING SECTION PROCEDURES

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TITLE: ENVIRONMENTAL  
ON-SITE MEDIA SAMPLING

PROC. NO.:  
EM-2-013

DATE:  
08/15/90

2502

Attachment H  
Sample Plan

### ENVIRONMENTAL MEDIA SAMPLING PLAN OUTLINE

#### I. INTRODUCTION

##### A. BACKGROUND OF PROJECT

##### B. DESCRIPTION OF PROJECT

##### C. PURPOSE OF SAMPLING

1. Chemical or Radiological Determination
2. Closure Standard

#### II. IDENTIFICATION OF KNOWN CONTAMINANTS

#### III. TOTAL NUMBER OF SAMPLES (requested)

##### A. SAMPLE LOCATIONS

##### 1. SAMPLES PER LOCATION

##### B. ANALYTICAL PARAMETERS REQUESTED

##### 1. RADIOLOGICAL

##### 2. CHEMICAL

##### A. ORGANIC

##### B. INORGANIC

##### C. REQUIRED SAMPLE VOLUMES

##### 1. PROPER SAMPLE CONTAINER

##### A. PLASTIC / GLASS

##### B. GLASS (TLC) TEFLOX LINED CLOSURE

##### C. PRESERVATIVE REQUIRED

#### IV. QA/QC SAMPLE REQUIREMENTS

##### A. NUMBER of DUPLICATES

##### 1. FIELD BLANKS

##### 2. TRIP BLANKS

#### V. EQUIPMENT NEEDED

#### VI. DECONTAMINATION OF EQUIPMENT

##### A. PRE SAMPLING

##### 1. COLLECTION OF RINSEATE SAMPLE

##### B. DURING SAMPLING

##### 1. COLLECTION OF RINSEATE SAMPLE

#### VII. SAMPLING METHODOLOGY

##### A. PROPER USE OF EQUIPMENT

##### B. METHOD OF EXTRACTION

50

**PIT 5 EXPERIMENTAL TREATMENT  
FACILITY (ETF) REMOVAL ACTION**

**HEALTH AND SAFETY PLAN**

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

November, 1991

# **PIT 5 EXPERIMENTAL TREATMENT FACILITY (ETF) REMOVAL ACTION**

## **HEALTH AND SAFETY PLAN**

### **FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

November, 1991

#### **APPROVAL:**



I.W. Diggs, Manager

Operable Unit 1

Westinghouse Environmental Management Company of Ohio



S.W. Coyle, Manager

Environmental Management

Westinghouse Environmental Management Company of Ohio

#### **CONCURRENCE:**

 11/19/91

J.J. Volpe, Vice President

Industrial Radiological Safety and Training

Westinghouse Environmental Management Company of Ohio

**PIT 5 EXPERIMENTAL TREATMENT FACILITY (ETF)  
HEALTH AND SAFETY PLAN**

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## **PIT 5 EXPERIMENTAL TREATMENT FACILITY (ETF) REMOVAL ACTION**

### **HEALTH AND SAFETY PLAN**

#### **1.0 INTRODUCTION**

The Pit 5 Experimental Treatment Facility (ETF) Removal Action consists of the removal, containerization, and storage on-site of the waste materials within the ETF and the ETF structure itself. These materials will be removed, containerized into drums or metal boxes, and transported to a designated on-site storage area. Vegetation in the vicinity of the ETF will be surveyed using field instrumentation, containerized and sampled to determine final disposition. Following the removal of the ETF and its contents, the soils beneath and in the vicinity of the ETF will be sampled and analyzed to determine whether contamination exists. Contaminated soils detected will be addressed in future removal actions or as part of the final remedial action for Operable Unit 1.

#### **2.0 SITE HISTORY**

During site production and operation, Waste Pit 5 received liquid waste slurries from the on-site refinery and recovery plants. These liquid wastes included neutralized raffinates, settling solids, slag-leach slurries, sump slurries, lime sludges and process waters from the wastewater treatment system. In 1984 the ETF was constructed for the purpose of volume reduction for final disposition of sludges generated and accumulating in Waste Pit 5. The location of the ETF is identified on Figure 1.

The entire ETF was built above ground measuring 20 feet by 48 feet. At the perimeter are wood retaining walls six (6) feet in height. The original design included a sand and gravel filter bed underlain by a plastic liner (see Figures 2 and 3). The ETF was also covered by a greenhouse type enclosure. It served to facilitate the thermal drying of the sludge. In addition, this cover provided protection from wind and precipitation.

In November 1984, approximately 12000 gallons of diluted Waste Pit 5 sludge was pumped to the ETF with the intent of dewatering. The liquids that were accumulated by this process were then pumped back into Waste Pit 5. The sludges have not been removed and remain within the ETF. This was the only volume of sludges processed through the ETF, and the facility/project was abandoned shortly thereafter.

On February 23, 1988, high winds removed the plastic roof from the ETF which then contained the dry Pit 5 materials. Interim measures were taken to minimize materials being blown out of the ETF structure. These measures included water being sprayed over the remaining residues and the placement of a tarpaulin over the ETF filter bed. This tarpaulin is being held in-place with concrete blocks. The ETF structure currently remains in this condition.

### 3.0 TASKS TO BE PERFORMED

Listed below are the major activities involved in the implementation of this removal action as discussed above. The activities are subdivided into individual actions that may occur in the performance of this removal action. Whether the action is expected to occur or not are appropriately indicated.

#### 3.1 The survey, removal and containerization of the surrounding vegetation will:

<u>YES</u>	Disturb Surface Soils	<u>NO</u>	Sample Surface Water
<u>YES</u>	Disturb Subsurface Soils	<u>NO</u>	Sample Lagoons
<u>NO</u>	Use Heavy Equipment	<u>NO</u>	Use Boat
<u>NO</u>	Enter Confined Space	<u>YES</u>	Involve Radioactivity
<u>NO</u>	Disturb Containerized Matter	<u>NO</u>	Involve Trenches

#### 3.2 The removal and containerization of the contents within the ETF will:

<u>NO</u>	Disturb Surface Soils	<u>NO</u>	Sample Surface Water
<u>NO</u>	Disturb Subsurface Soils	<u>NO</u>	Sample Lagoons
<u>YES</u>	Use Heavy Equipment	<u>NO</u>	Use Boat
<u>NO</u>	Enter Confined Space	<u>YES</u>	Involve Radioactivity
<u>NO</u>	Disturb Containerized Matter	<u>NO</u>	Involve Trenches

#### 3.3 The demolition of the ETF structure will:

<u>NO</u>	Disturb Surface Soils	<u>NO</u>	Sample Surface Water
<u>NO</u>	Disturb Subsurface Soils	<u>NO</u>	Sample Lagoons
<u>YES</u>	Use Heavy Equipment	<u>NO</u>	Use Boat
<u>NO</u>	Enter Confined Space	<u>YES</u>	Involve Radioactivity
<u>NO</u>	Disturb Containerized Matter	<u>NO</u>	Involve Trenches

3.4 The sampling of surface soils beneath and in the vicinity of the ETF will:

<u>YES</u>	Disturb Surface Soils	<u>NO</u>	Sample Surface Water
<u>NO</u>	Disturb Subsurface Soils	<u>NO</u>	Sample Lagoons
<u>NO</u>	Use Heavy Equipment	<u>NO</u>	Use Boat
<u>NO</u>	Enter Confined Space	<u>YES</u>	Involve Radioactivity
<u>NO</u>	Disturb Containerized Matter	<u>NO</u>	Involve Trenches

3.5 The transport of containerized wastes to an on-site predetermined storage area will:

<u>NO</u>	Disturb Surface Soils	<u>NO</u>	Sample Surface Water
<u>NO</u>	Disturb Subsurface Soils	<u>NO</u>	Sample Lagoons
<u>YES</u>	Use Heavy Equipment	<u>NO</u>	Use Boat
<u>NO</u>	Enter Confined Space	<u>NO</u>	Involve Radioactivity
<u>NO</u>	Disturb Containerized Matter	<u>NO</u>	Involve Trenches

4.0 **HAZARD ASSESSMENT**

A preliminary review of the conditions in the immediate vicinity of the ETF identify potential hazards associated with this removal action as listed below. Prior to the initiation of actual removal action activities, a complete and thorough assessment of the conditions will be conducted to ensure that a safe working environment will be provided. Based on this assessment, any and all newly identified hazards will be addressed with representatives of Westinghouse Environmental Management Company of Ohio (WEMCO), within the Industrial, Radiological, Safety and Training (IRS&T) organization to determine the degree of hazard and whether any modifications are required to this plan.

4.1 Health Hazards

- Noise - Any time noise levels exceed 85 decibels, hearing protection shall be worn regardless of the duration of the exposure. The monitoring of these noise levels will be performed by IRS&T representatives as necessary throughout the removal action activities.
- Health hazards associated with radiological and chemical contamination expected to be encountered during this removal action are discussed in greater detail later in Sections 4.3 and Section 4.4 respectively. These health hazards exist and apply to all individuals working in the immediate vicinity of the ETF removal action.

#### 4.2 Safety Hazards

- **Confined Space Entry Potential** - Confined spaces are generally defined as a potential oxygen deficiency condition and/or limited space constraints including access. Entry into a confined space is controlled as defined in WEMCO Procedure #IH&S-IH-05, "Control of Entering and/or Working in a Confined Space."
- **Heavy Equipment Operation** - All personnel involved in the immediate vicinity of the heavy equipment shall be aware and cognizant of its movement to prevent personal injury. Personnel shall remain clear of the equipment during the removal of waste materials from within the ETF structure and the actual demolition of the structure.
- **Loading of Containers** - During the loading of containers, hazards may include the wastes missing the containers, the containers tipping over, and the mobility of the heavy equipment bucket during the loading process. Personnel shall be cautious during the container filling operation and Personal Protective Equipment (PPE) as specified in Section 6.2 shall be worn.
- **Unsupported Structure** - During the removal action, additional support of the walls of the ETF may be required to prevent their collapse either inward and outward. Additional support may be necessary during the removal of waste materials from within the ETF structure. Areas within limits of a wall collapse shall be kept clear at all times to prevent injury to involved personnel.

#### 4.3 Radiation Hazards

The primary routes of entry of the potential site contaminants are inhalation and direct radiation exposure. The following table indicates radiological constituents expected to be encountered during the removal action activities. Total Uranium, Thorium-230, and Radium 226 are to represent the radionuclides of concern. Technetium-99 is identified on the table of radiological constituents in Pit 5, however, Technetium-99 does not represent a significant threat in the exposure scenarios provided in the Removal Site Evaluation (RSE), developed for the ETF project. In addition, the total external exposure dosages and risks for the ETF worker has been calculated as 87.86 mrem/year and  $1.76 \times 10^{-5}$  risk per year respectively.

<u>Contaminant</u>	<u>Concentration</u>
Uranium (Total)	687 pCi/gram *
Thorium 230	1872 pCi/gram **
Radium 226	142 pCi/gram **

\* Actual concentration determined from laboratory analysis.

\*\* Estimated values based on calculated ratios from the currently published results of the Weston Characterization Study indicating that the maximum relative proportion of Uranium-238 to Thorium and Radium are 1.65 and 0.125 respectively.<sup>1</sup>

In addition to those suspected radionuclides and chemicals expected to be encountered, there may be a potential for encountering small concentrations of other radionuclides and/or chemical hazards. These include mercury and plutonium. The existence of plutonium was postulated during the review of the site history and available records. These additional contaminants are minor contributors to the overall risk estimates and will be suppressed with the appropriate Personal Protective Equipment (PPE) established for the primary contaminants during this removal action.

#### 4.4 Chemical Hazards

Since the sludges that were processed through the ETF originated from Waste Pit 5 and Waste Pit 5 has been declared a RCRA Hazardous Waste Management Unit (HWMU) by process knowledge to have received the RCRA listed organic chemical 1,1,1-Trichloroethane (TCA), this chemical is therefore a contaminant to be conscious of. Table 1 identifies the chemical constituents observed to be in Waste Pit 5 and therefore are also expected to be in the ETF contents. The additional noncarcinogenic contaminants identified on Table 1 (lead, calcium, iron, and aluminum) were not considered in the pathway analysis performed as part of the RSE since the risks associated with the arsenic and radionuclides were considered to be sufficient to evaluate the magnitude of the potential or actual threat.

---

<sup>1</sup> Removal Site Evaluation - Pit 5 Experimental Treatment Facility, Feed Materials Production Center, U.S. Department of Energy, Fernald, Ohio, June 12, 1991.

<u>Target Contaminant</u>	<u>Material Concentration*</u>	<u>Permissible Exposure Limit (PEL)</u>	<u>Short-Term Exposure Limit(STEL)</u>
Arsenic	139-2800 mg/kg	0.01 mg/m <sup>3</sup>	---
Mercury	0.4-1.8 mg/kg	0.05 mg/m <sup>3</sup>	---
Lead	---	0.05 mg/m <sup>3</sup>	---
Silver	---	0.01 mg/m <sup>3</sup>	---
Magnesium Fluoride	---	2.5 mg/m <sup>3</sup>	---
Vanadium	792-5380 mg/kg	0.05 mg/m <sup>3</sup>	---
1,1,1-Trichloroethane	The concentration level was below quantification levels. See Appendix B of Reference 1 in Table 1.	1900 mg/m <sup>3</sup> (350 ppm)	2460 mg/m <sup>3</sup> (450 ppm)
PolychlorinatedBiphenyl	750 ppb	0.5 mg/m <sup>3</sup>	---

\* As reported in Weston CIS (see Table 1)

#### 4.5 Heat/Cold Stress

Heat stress and/or cold stress could become a concern during this removal action. Requirements for the control of both heat and cold stress shall be implemented as required in accordance with the IH&S Manual. The time frame for this removal action warrants the identification of such potential for either heat or cold stress.

## 5.0 MONITORING

### 5.1 Goals

Air monitoring will be performed to assure that contaminant concentrations in the breathing zone do not exceed the concentrations specified by established exposure levels. The action levels include an additional safety factor of four to account for potential inaccuracies associated with the use of field instrumentation and the data generated.

WEMCO policy requires engineering controls or the use of Personal Protective Equipment (PPE) to limit on-site exposures to the action limit values. It is advisable to keep exposure to chemicals as minimal as possible since there is insufficient data to predict the combined health effects of most chemical mixtures.

### 5.2 Monitoring Equipment and Frequency of Monitoring

In the event that action levels are exceeded for the following areas, all work will be discontinued pending specific evaluation of the work area and the applicable conditions.

#### 5.2.1 Airborne Radioactivity

Air sampling will be performed for long lived alpha radioactivity utilizing a beta-gamma Geiger-Mueller (G-M) probe.

The following monitoring equipment shall be used as necessary for the implementation of this removal action:

#### Alpha and Beta-Gamma Monitor/Probe

Hazard Measured:	Alpha, Beta and Gamma Radiation.
Application:	Monitors surfaces for radioactive contamination.
Detection Method:	Alpha Scintillator and Geiger-Mueller Tube.
General Care:	Daily source and battery check.
Calibration:	Every six (6) months.

**Air Sampler (High Volume)**

Hazard Measured:	Collects airborne particulates for laboratory analysis.
Application:	Measure of air activity when surface contamination is present.
Detection Method:	Performed in laboratory
General Care:	Daily inspection
Calibration:	Every six (6) months

**5.2.2 Radioactive Surface Contamination**

Radioactive surface contamination will be identified by WEMCO IRS&T personnel as they perform the required survey for the appropriate work permits. Radioactive surface contamination will be monitored at any time when surface soils are disturbed during removal action activities.

The following monitoring equipment will be used as necessary for the implementation of this removal action:

**Alpha and Beta-Gamma Monitor/Probe**

Hazard Measured:	Alpha, Beta and Gamma Radiation.
Application:	Monitors surfaces for radioactive contamination.
Detection Method:	Alpha Scintillator and Geiger-Mueller Tube.
General Care:	Daily source and battery check.
Calibration:	Every six (6) months.



### 5.2.3 Chemical Contamination

Monitoring and sampling activities for chemical contamination will be performed during the removal action activities. This monitoring will assure that established action levels are not exceeded. As determined to be necessary, IRS&T personnel will perform the monitoring and sampling as required.

The following monitoring equipment will be used as necessary for the implementation of this removal action:

A portable Photovac instrument will be utilized as the primary photoionization detector with an HNu instrument used as backup.

#### Photoionization Detectors

Hazard Measured:	Organic gases and vapors.
Application:	Detects total concentrations of many organic gases and vapors.
Detection Method:	Ionizes molecules using ultraviolet (UV) radiation and produces a current that is proportional to the number of ions.
General Care:	Recharge or replace battery. Regularly clean lamp window. Regularly clean and maintain the instrument and accessories.
Calibration:	Daily. Factory calibration once/year.

MIE MiniRAM

Hazard Measured:	Airborne Dusts.
Application:	For monitoring dusts containing certain amounts of toxic chemicals (see Section 4.4).
Detection Method:	Forward light scattering photometer.
General Care:	Recharge or replace battery.
Calibration:	Annual factory calibration with field calibration using built-in reference scatterer before each use.

5.3 Field Action Levels

<u>Instrument</u>	<u>Frequency</u>	<u>Action Level*</u>	<u>Required Action</u>
Alpha Probe	Pre-job, Daily and as required by IRS&T.	300 cpm above background	Note 1 Below
Beta-Gamma Probe	Pre-job, Daily and as required by IRS&T.	300 cpm above background	Note 1 Below
Photoionization Meter	Daily and as required by IRS&T.	Bkgd to 10 ppm 10 to 25 ppm* > 25 ppm*	Note 1 Below Note 2 Below Note 3 below
MIE MiniRAM Dust Monitor	Daily and as required by IRS&T.	Bkgd to 0.5mg/m <sup>3</sup> 0.5 to 5.0 mg/m <sup>3</sup> > 5.0 mg/m <sup>3</sup>	Note 1 Below Note 2 Below Note 3 Below

<u>Instrument</u>	<u>Frequency</u>	<u>Action Level*</u>	<u>Required Action</u>
B2 filter sampler for analyzing As,Hg,Pb, Ag,& MgF <sub>2</sub> with lab analysis	Daily and as required by IRS&T.	Note 4 Below.	Note 4 Below.
B2 charcoal tube sampler for analyzing 1,1,1-trichloroethane by laboratory	Daily and as required by IRS&T.	Note 4 Below.	Note 4 Below.
High Volume Air Sampler	Continuous	No real-time results.	N/A

\* Above background measurements.

NOTE: Required actions identified above are as follows:

- 1 - Full-Faced (FF) air purifying respirators with combination HEPA filter and organic vapor/acid gas cartridges.
- 2 - Supplied Air Respirator.
- 3 - Withdraw from affected areas immediately.
- 4 - No actions need be listed since this sampling is not able to provide real-time results.

## 6.0 PERSONAL PROTECTIVE EQUIPMENT

All personnel working beyond the administration buildings must also wear assigned dosimetry badges/monitors. In addition, all employees in the specific task areas will wear the following Personal Protective Equipment (PPE) while performing the applicable tasks. The PPE may be upgraded or downgraded depending on the field conditions and instrumentation measurements obtained in the work areas. Changes in the PPE must be approved by the appropriate IRS&T representative prior to implementation of the change.

6.1 Survey, Removal, and Containerization of Vegetation

<u>ITEM</u>	<u>NEED</u>	<u>JUSTIFICATION</u>
Air Purifying Respirator	Yes	Minimum Requirement as specified in Section 5.3
Cartridges (HEPA/Organic Vapor):	Yes	Minimum Requirement as specified in Section 5.3
Hard Hat	Yes	Minimum Requirement
Hearing Protection	No	
Inner Gloves	No	
Rubber/Latex Boots	No	
Leather Palm Gloves	Yes	Protection from hand-held equipment
Neoprene/Nitrile Gloves	No	
Coveralls	No	
Plain Tyvek	Yes	Prevent gross contamination of process coveralls and ease of decontamination
Process Coveralls	Yes	Minimum Requirement
PVC Gloves	No	
Supplied Air Respirator	No (yes)	Required if action levels are exceeded
Safety Glasses	Yes	Minimum Requirement
Safety Goggles	No	
Safety Shoes	Yes	Minimum Requirement
Saranex Tyvek	No	

<u>ITEM</u>	<u>NEED</u>	<u>JUSTIFICATION</u>
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Disposable Shoe Covers	No	
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Face Shield	No	
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6.2 Removal and Containerization of ETF Contents

<u>ITEM</u>	<u>NEED</u>	<u>JUSTIFICATION</u>
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Air Purifying Respirator	Yes	Minimum Requirement as specified in Section 5.3
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Cartridges (HEPA/ Organic Vapor):	Yes	Minimum Requirement as specified in Section 5.3
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Hard Hat	Yes	Minimum Requirement
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Hearing Protection	No (yes)	As needed if noise from heavy equipment is excessive
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Inner Gloves	Yes	Secondary hand protection from exposure to hazardous chemicals
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Rubber/Latex Boots	Yes	Protection from hazardous chemicals
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Leather Palm Gloves	No	
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Neoprene/Nitrile Gloves	Yes	Primary hand protection from exposure to hazardous chemicals
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Coveralls	No	
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Plain Tyvek	Yes	Prevent gross contamination of process coveralls and ease of decontamination
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Process Coveralls	Yes	Minimum Requirement
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PVC Gloves	No	
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<u>ITEM</u>	<u>NEED</u>	<u>JUSTIFICATION</u>
Supplied Air Respirator	No (yes)	Required if action levels are exceeded
Safety Glasses	Yes	Minimum Requirement if FF respirators are not worn
Safety Goggles	No	
Safety Shoes	Yes	Minimum Requirement
Saranex Tyvek	No	
Disposable Shoe Covers	Yes	Prevent gross hazardous chemical contamination of boots and ease of decontamination
Face Shield	No (yes)	Workers in the area of container loading must wear face shields if not wearing FF respirators

### 6.3 Demolition and Containerization of ETF Structure

<u>ITEM</u>	<u>NEED</u>	<u>JUSTIFICATION</u>
Air Purifying Respirator	Yes	Minimum Requirement as specified in Section 5.3
Cartridges (HEPA/Organic Vapor):	Yes	Minimum Requirement as specified in Section 5.3
Hard Hat	Yes	Minimum Requirement
Hearing Protection	No	
Inner Gloves	No	
Rubber/Latex Boots	No	
Leather Palm Gloves	Yes	Protection from hand-held equipment

<u>ITEM</u>	<u>NEED</u>	<u>JUSTIFICATION</u>
Neoprene/Nitrile Gloves	Yes (no)	Primary hand protection from exposure to hazardous chemicals
Coveralls	No	
Plain Tyvek	Yes	Prevent gross contamination of process coveralls and ease of decontamination
Process Coveralls	Yes	Minimum Requirement
PVC Gloves	No	
Supplied Air Respirator	No (yes)	Required if action levels are exceeded
Safety Glasses	Yes	Minimum Requirement
Safety Goggles	No (yes)	Required if dismantling dictates the use of saws
Safety Shoes	Yes	Minimum Requirement
Saranex Tyvek	No	
Disposable Shoe Covers	Yes	Prevent gross hazardous chemical contamination of boots and ease of decontamination
Face Shield	No (yes)	Required if dismantling dictates the use of saws

#### 6.4 Sampling of Surface Soils Beneath and in the Vicinity of the ETF

<u>ITEM</u>	<u>NEED</u>	<u>JUSTIFICATION</u>
Air Purifying Respirator	Yes	Minimum Requirement as specified in Section 5.3
Cartridges (HEPA/ Organic Vapor):	Yes	Minimum Requirement as specified in Section 5.3

<u>ITEM</u>	<u>NEED</u>	<u>JUSTIFICATION</u>
Hard Hat	Yes	Minimum Requirement
Hearing Protection	No	
Inner Gloves	No	
Rubber/Latex Boots	No	
Leather Palm Gloves	No (yes)	As needed for physical protection of hands
Neoprene/Nitrile Gloves	Yes	Primary hand protection from exposure to hazardous chemicals
Coveralls	No	
Plain Tyvek	Yes	Prevent gross contamination of process coveralls and ease of decontamination
Process Coveralls	Yes	Minimum Requirement
PVC Gloves	No	
Supplied Air Respirator	No (yes)	Required if action levels are exceeded
Safety Glasses	Yes	Minimum Requirement
Safety Goggles	No	
Safety Shoes	Yes	Minimum Requirement
Saranex Tyvek	No	
Disposable Shoe Covers	Yes	Prevent gross hazardous chemical contamination of boots and ease of decontamination
Face Shield	No	



6.5 Transportation of Containerized Wastes to the On-site Storage Area

<u>ITEM</u>	<u>NEED</u>	<u>JUSTIFICATION</u>
Air Purifying Respirator	No	
Cartridges (HEPA/ Organic Vapor):	No	
Hard Hat	Yes	Minimum Requirement
Hearing Protection	No	
Inner Gloves	No	
Rubber/Latex Boots	No	
Leather Palm Gloves	No (yes)	As needed for physical protection of hands
Neoprene/Nitrile Gloves	No	
Coveralls	No	
Plain Tyvek	No	
Process Coveralls	Yes	Minimum Requirement
PVC Gloves	No	
Supplied Air Respirator	No	
Safety Glasses	Yes	Minimum Requirement
Safety Goggles	No	
Safety Shoes	Yes	Minimum Requirement
Saranex Tyvek	No	
Disposable Shoe Covers	No	
Face Shield	No	

## 7.0 SITE CONTROL

### 7.1 Access

The work area will be divided into two specific areas. The area where the removal activities will be taking place will be the Exclusion Zone. This zone has the highest potential hazard due to physical and chemical dangers. Access to the Exclusion Zone will be restricted to those individuals trained and approved to perform the removal action activities. The Exclusion Zone will be delineated using barrier tape or other easily recognizable devices with one common entrance/exit point. The Exclusion Zone will include the entire ETF structure, the vegetation surrounding the ETF and additional surrounding areas needed for the temporary storage of equipment and containers of waste being generated. The Exclusion Zone boundaries may need to be expanded or altered to accommodate airborne hazards caused by the movement and loading of excessively dry waste materials or other unforeseen circumstances that may arise during the project. If the Exclusion Zone is to be altered significantly, appropriate IRS&T personnel will be consulted.

The second zone to be established will be the Contamination-Reduction Zone. This area will be located immediately prior to the entrance/exit to the Exclusion Zone. This zone will also be delineated using barrier tape or other easily recognizable devices. This zone will be utilized for the removal of disposable protective clothing including boots, gloves, tyvek suits, etc. and the decontamination of equipment utilized to perform this activity. Entrance to the Exclusion Zone shall be limited to one entrance/exit point, preferable on the upwind side of the removal action activities, and shall be closely monitored and controlled by the field supervisor. Personnel may be needed in this zone to aid workers in decontamination activities upon their departure from the Exclusion Zone.

### 7.2 Bioassay Samples

Personnel involved in this project are required to participate in a routine periodic urine assay program. Any suspected acute exposures to hazardous substances shall be reported and may require additional personal sampling.

Any circumstances which could have resulted in an intake of radioactive materials by inhalation, ingestion, or absorption shall immediately be reported to the supervisor. The supervisor shall immediately report the circumstance of possible radioactive material intake to IRS&T Radiological Safety Section for evaluation. The involved employee(s) shall report to the Dosimetry at the end of their shift to complete an Incident Investigation Report (IRR) (Form FMPC-ES&H-1458), and submit an incident sample. The involved

employee(s) shall also report to the Dosimetry at the start of their next shift to submit a follow-up sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

### 7.3 Medical Monitoring

In accordance with OSHA requirements identified in 29 CFR Part 1910.120, all personnel directly involved in this removal action are required to participate in a medical monitoring program. This program shall include at a minimum:

- a baseline medical examination.
- annual medical examinations.
- subsequent medical examinations following the project, if so required.
- WEMCO respirator medical approval.

Prior to the start of work, all personnel directly involved with this removal action shall be identified by name and badge number. Each individual identified shall be subject to a medical surveillance approval by the Director of Medical Services.

### 7.4 Safety Meetings

A safety meeting, including all personnel directly involved in the removal action, shall be conducted prior to the commencement of the on-site removal action activities and the start of each days work activities. All of these meetings must be documented and contain, at a minimum, the following topics:

- employee signatures, badge numbers, etc.
- work operations
- personnel protective equipment
- all monitoring data
- hazard communications
- monitoring tests and results
- decontamination
- project task organization
- physical stress
- emergency procedures
- communications
- general safety
- general housekeeping

An initial safety meeting will be conducted prior to the start of activities. This meeting will review and train all involved employees on this Health and Safety Plan for the implementation of this removal action.

## 8.0 TRAINING REQUIREMENTS

All personnel assigned to directly support this removal action shall satisfy the following:

- 40 hour OSHA training,
- 8 hour annual refresher training (if applicable),
- 8 hour supervisory training (if applicable),
- 24 hour supervised field experience,
- WEMCO radiation safety training,
- WEMCO respirator medical review, respirator training, and quantitative fit-test or equivalent approved by WEMCO Industrial Hygiene,
- Document all safety meetings,
- Training on this health and safety plan including site specific hazards, conditions, and procedures, and
- Training on Material Safety Data Sheets (MSDS) for anticipated hazardous chemicals to be encountered during this removal action.

Individuals not required to take the 40 hours of compliance training must be escorted by a person with the 40 hours of training. However, these individuals must attend a visitor orientation and pre-entry briefing on this Health and Safety Plan. Examples of individuals in this category include:

- Managers and employees visiting the site occasionally for meeting, inspections, etc.,
- Personnel making deliveries, and/or
- Vendor Service/Technical personnel.

## 9.0 EXPOSURE SYMPTOMS

Exposure to low levels of radioactivity do not produce acute exposure symptoms. However, chronic exposures and exceeding high exposures may cause delayed effects such as cancer. Such exposures are to be kept As Low As Reasonable Achievable (ALARA).

Exposure symptoms and first aid for acute and exceedingly high exposure of radiological materials are summarized below. Appropriate documentation and guidelines for these identified chemicals will be made available at the work area. During the removal action, it is not expected that high exposure to radiological or chemical contaminants will be encountered to administer any of the first aid as

described below. However, if such an exposure is received, the following would then apply.

### RADIONUCLIDES

Exposure Routes:	Respiratory tract and broken skin
Acute Symptoms:	There are no typically identified acute symptoms, however, respiratory irritation and kidney distress may be observed at exceedingly high exposures.
First Aid:	<p><u>Inhalation</u> - Remove individual to fresh air. If difficulty breathing, begin bioassay procedures (urinalysis) to quantify exposure.</p> <p><u>Broken Skin</u> - Flush with copious amount of water for 15 minutes. Check clean skin with frisker to ensure complete removal.</p>

### ARSENIC

Exposure Routes:	Inhalation, skin absorption, skin and/or eye contact, and ingestion.
Acute Symptoms:	Respiratory irritation, gastrointestinal disturbances, and dermatitis.
Chronic Effects:	Cumulative poison and suspect human carcinogen.
First Aid:	<p><u>Skin</u> - Wash with soap and water immediately and seek medical attention as soon as possible.</p> <p><u>Eye</u> - Immediately wash eyes with large amounts of water, occasionally lifting lower and upper eye lids. Seek medical attention immediately.</p> <p><u>Ingestion</u> - Seek medical attention immediately.</p>

**1,1,1-Trichloroethane**

Exposure Routes: Inhalation, ingestion and skin and/or eye contact.

Acute Symptoms: Headaches, poor equilibrium, irritation of the eyes, cardiac arrhythmias (heartbeat irregularity), dermatitis, Central Nervous System depression.

First Aid: Inhalation - Move exposed person to fresh air. If breathing has stopped, perform artificial respiration. Keep affected person warm and at rest. Seek medical attention as soon as possible.

Skin - Wash affected area promptly with soap and water. Seek medical attention promptly.

Ingestion - Seek medical attention immediately.

Eye - Immediately wash eyes with large amounts of water, occasionally lifting lower and upper eye lids. Seek medical attention immediately.

**VANADIUM**

Exposure Routes: Inhalation, skin absorption, skin and/or eye contact, and ingestion.

Acute Symptoms: Eye irritation, burning or itching, sore throat, chest pain, cough, edema, pneumonia.

First Aid: Skin - Wash with soap and water immediately and seek medical attention as soon as possible.

Eye - Immediately wash eyes with large amounts of water, occasionally lifting lower and upper eye lids. Seek medical attention immediately.

Ingestion - Seek medical attention immediately.

**Polychlorinated  
biphenyls(PCB 1254)**

**Exposure Routes:** Inhalation, absorption, ingestion, and skin and/or eye contact.

**Acute Symptoms:** Irritation to the eyes and skin, acne-form dermatitis, jaundice, and dark urine.

**First Aid:** Inhalation - Move exposed person to fresh air. If breathing has stopped, perform artificial respiration. Keep affected person warm and at rest. Seek medical attention as soon as possible.

Skin - Wash affected area promptly with soap and water. Seek medical attention promptly.

Ingestion - Seek medical attention immediately.

Eye - Immediately wash eyes with large amounts of water, occasionally lifting lower and upper eye lids. Seek medical attention immediately.

## **10.0 SITE ENTRY PROCEDURES**

During all removal action activities, the following procedures must be implemented:

- Identify Exclusion Zone, Contamination Reduction Zone, and break area.
- Perform daily safety meetings to familiarize the work team with site specific hazards.
- Discuss alternate communication signals (if applicable and necessary).
- Perform respirator check-out and fit test prior to use.
- Use of the "buddy system". Teams of not less than two individuals must be used for all activities within the Exclusion Zone.

## 11.0 DECONTAMINATION

### 11.1 General

Necessary equipment for decontamination of radiological or chemical substances shall be readily available in the area surrounding the Exclusion Zone. Decontamination reduces the threat of spread of contaminants to other areas on-site by the cleaning of equipment and personnel at the work site prior to the departure from the area. It is advised at all times to reduce the amount of contact to contamination in the work areas where possible thereby minimizing the degree of decontamination required. If necessary, personnel aiding in the decontamination of Exclusion Zone workers shall be equipped with PPE to prevent the threat of contamination to themselves.

### 11.2 Procedures

The following procedures will be implemented for proper decontamination of utilized equipment and personnel during these activities:

- Personnel enter decontamination area from Exclusion Zone and drop tools, etc. on contaminated side of barrier tape or object. This equipment will be decontaminated for later use.
- Remove as much contamination off of protective clothing as possible utilizing wash tubs and brushes. Step through each tub cleaning outer boots and gloves of gross contamination as much as possible.
- Remove protective clothing and place on contaminated side of barrier tape or object. This waste will later be placed into appropriate containers.
- Before departure from the decontamination area, all personnel must be "frisked" with radiation detectors to verify successful decontamination. All equipment must also be surveyed prior removal from the area.
- In all cases of radiological contamination, Radiological Safety shall be notified to perform decontamination as per FMPC SP-P-35-017. The AEDO shall also be notified and Bioassay requirements will be implemented per Section 7.2 above.



All wastes generated resulting from removal action activities shall be placed into appropriate containers and all attempts will be made not to combine wastes of different characteristics in the same container. Protective clothing, decontamination materials, sampling wastes, etc. shall also be placed into containers. Full containers shall be appropriately marked and labelled to identify the contents within.

Containers to be utilized for storage of waste materials shall comply with DOE requirement 49 CFR Parts 171-178, and RCRA requirements 40 CFR Parts 264, 265 and 300, where applicable.

**13.0 CONTINGENCY PLANS****13.1 Incidents or Injuries**

For the possible intake of radiological substances, see statement on the submission of urine samples for radiation exposure in WEMCO Standard Operating Procedures (SOP) 11-C-245.

Incidents of injury involving potential intake of other hazardous substances shall be reported by the involved employee to the supervisor and the WEMCO Communications Center.

The WEMCO Communications Center will notify local authorities of the incident or injury and the authority having jurisdiction will respond in a coordinated effort with the FEMP Response Team.

**13.2 Pre-emergency Planning**

During the training and pre-work safety meetings, all employees directly involved with this removal action shall be trained and reminded of the provisions of the plant emergency procedures, alarm signals and communications, evacuation routes, emergency reporting, and the importance of maintaining communications with the site emergency preparedness personnel via a two-way radio or cellular telephone. Testing will be performed on all equipment prior to the initiation of daily activities to verify the equipment is in optimum working order.

### 13.3 Lines of Authority

The supervisor in charge has the primary responsibility for the prevention of emergency conditions. In the event that an emergency does occur, the individual involved or observing the emergency condition shall immediately notify the supervisor, the Communications Center, or the WEMCO Assistant Emergency Duty Officer (AEDO). The AEDO is responsible for ensuring that the corrective actions have been implemented, appropriate personnel notified, and reports completed as required. Personnel observing unsafe conditions at the work site shall report same to the supervisor in charge or the Health and Safety Officer who will immediately investigate the reported activity and act accordingly.

### 13.4 Evacuation

In the event an evacuation is required, the supervisor will be responsible for the notification of all involved personnel. Personnel performing this removal action will proceed to the rally point designated by the supervisor. These rally points are identified on Figure 4. When the supervisor is informed of an all-clear, personnel will be released from the rally point.

In the event of an emergency which necessitates an evacuation of the Exclusion Zone, the 2-2, 2-2 alarm signal shall be sounded over the plant alarm system; a voice message will follow over the Emergency Message System (EMS) instructing personnel to immediately proceed to the designated rally point or to a temporary assembly area to be determined by Emergency Planning personnel prior to project start-up. Personnel will follow instructions given by the rally point or assembly area coordinator and participate in the accountability process. When an all-clear condition has been achieved, personnel will be released from the rally point or assembly area. It is conceivable that the plant alarm system horns or EMS will not be audible in the area of the ETF removal action. For this reason, communications between the supervisor and the Communications Center will be maintained at all times via a two-way radio.

### 13.5 Emergency Notification

All emergencies shall be reported immediately. Emergencies can be reported via cellular telephone (if available) by dialing 738-6511; or by contacting the communications center via a two-way radio.

### 13.6 Emergency Equipment

The following safety equipment will be available for employee usage at the construction zone. The location of this equipment will be identified at each safety meeting.

- fire extinguishers
- portable eye wash stations
- portable safety showers
- telephones
- spill drums
- spill absorbants
- nearest manual fire alarm
- two-way radio
- emergency SCBA units
- respirators
- clean-up materials
- local evacuation alarm

### 13.7 Fire, Explosion, or Medical Emergency

In the event of a fire, explosion, or medical emergency, the Communications Center shall be notified immediately by activating manual fire alarm, using the two-way radio or by calling 738-6511. The Communications Center operator will activate the Emergency Response Team and dispatch them to the appropriate location. Personnel in the immediate area should evacuate immediately to a safe location and await further instructions.

A map indicating the route to the nearest medical facility (which is located in the back of Building 53) is shown on Figure 5. Complete medical assistance is available and will be provided by trained professional medical personnel.

### 13.8 Additional Information

#### 13.8.1 Hospitals

The WEMCO Medical Facility (Building 53) is the primary choice for on-site injuries. Off-site emergencies can also be handled utilizing these facilities. The WEMCO Ambulance or "Life Flight" helicopter will transport the injured to the nearest hospital if necessary. WEMCO maintains an emergency response capability which includes an ambulance and Emergency Medical Technicians (EMTs).

### 13.8.2 Emergency Telephone Numbers

The following telephone numbers are FEMP emergency telephone numbers.

<u>NAME</u>	<u>NUMBER</u>	<u>RADIO</u>
Ambulance	738-6511	202 or control
Hospital	738-6511	202 or control
Fire	738-6511	202 or control
Emergency Response	738-6511	202 or control
Industrial Hygiene	738-6207	357
Radiological Safety	738-6889	355
Fire and Safety	738-6235	303
Assistant Emergency Duty Officer (AEDO)	738-6431 or 6295	202

## 14.0 AMENDMENTS

This Health and Safety Plan is based on information available at the time of preparation. Unexpected conditions may arise during the removal actions that may require reassessment of existing safety procedures. It is important that personnel protective measures be thoroughly assessed by the supervisor in charge and the IRS&T representative prior to and during the planned task activities. Unplanned activities and/or changes that are not a part of this removal action as discussed above, shall require an evaluation of the unplanned activity and/or change. The evaluation of the unplanned activity and/or change may require subsequent reviews, revisions, and approvals of this plan, if appropriate and necessary. If changes to the plan are warranted, they shall be submitted as an amendment to this plan and must be approved by appropriate personnel prior to the implementation of the specific amendment.

## 15.0 APPROVAL AND COMPLIANCE STATEMENTS

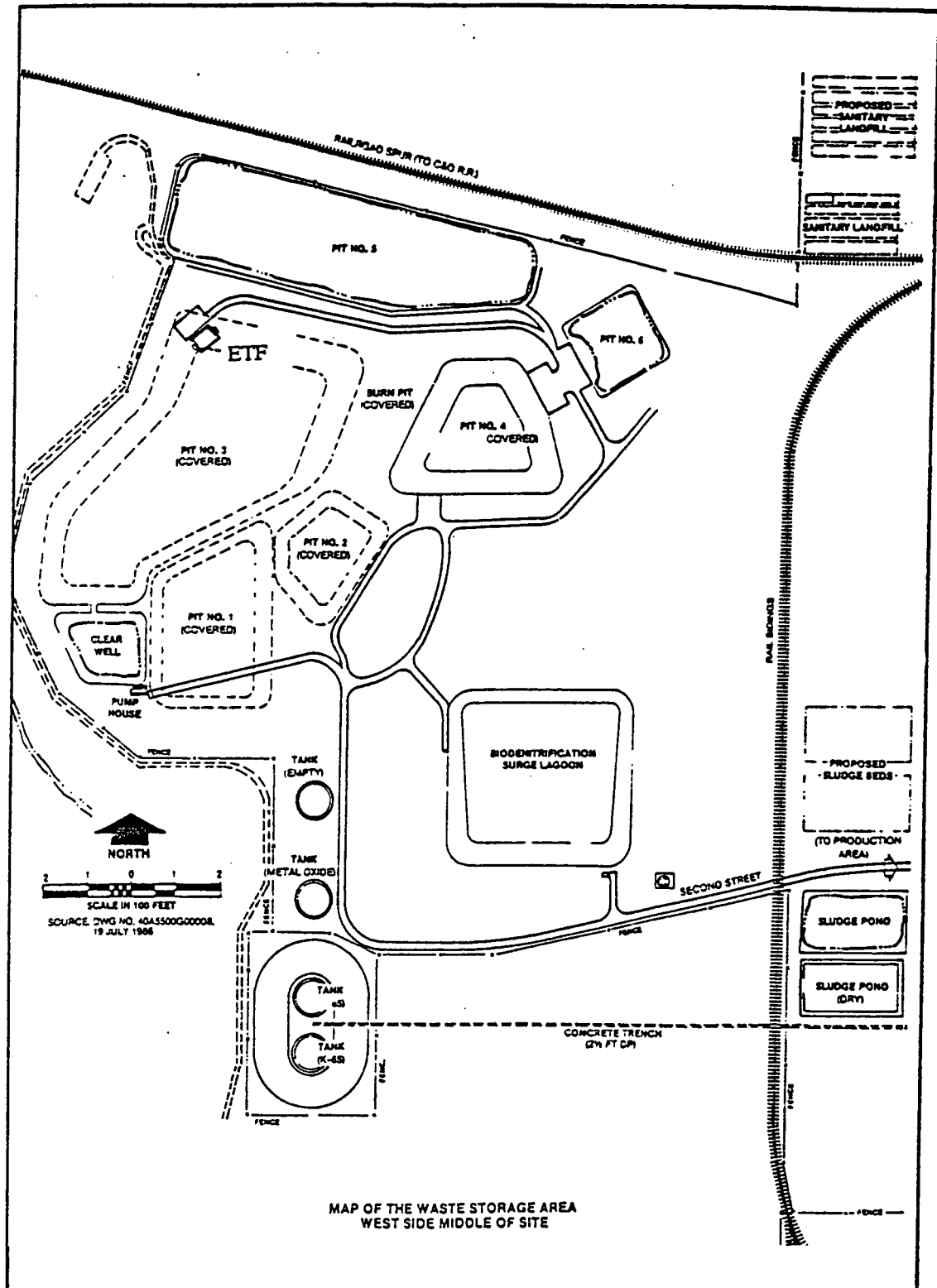
This site specific health and safety plan was developed for the use of WEMCO employees and subcontractors. It is intended for the FEMP and specifically for personnel directly involved in the performance of the Pit 5 ETF removal action consisting of the following activities:

- Surveying, removal, and containerization of vegetation in the vicinity of the ETF structure;
- Removal and containerization of materials within the ETF;
- Dismantling and containerization of the ETF structure;
- Transport of the containerized waste materials to the designated on-site RCRA storage area;
- Soil sampling beneath and in the vicinity of the ETF.

All personnel performing these tasks must read and understand this site specific health and safety plan and agree to follow the provision as stated below. Written documentation must be maintained with signatures of all personnel directly involved with the performance of the tasks identified as part of this removal action.

*It will be assured that the provisions of this health and safety plan are implemented and the reasons for any additional field action and/or necessary change will be documented. Compliance with the provisions of this health and safety plan may be audited through announced or unannounced site visits. These site visits may be performed by DOE or WEMCO personnel.*

FIGURE 1.  
OPERABLE UNIT 1 / ETF LOCATION MAP



# EXPERIMENTAL TREATMENT FACILITY (ETF) END VIEW

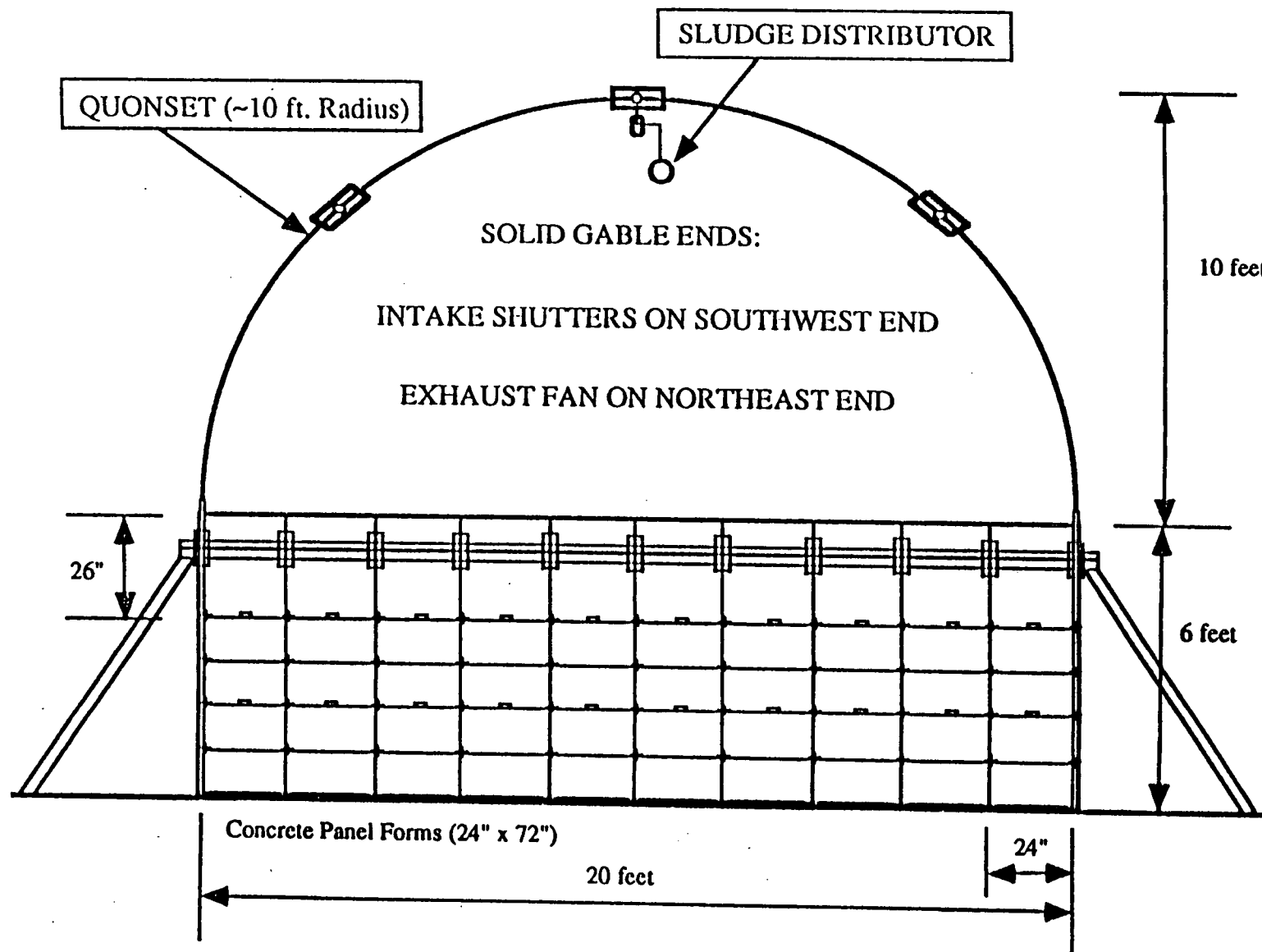
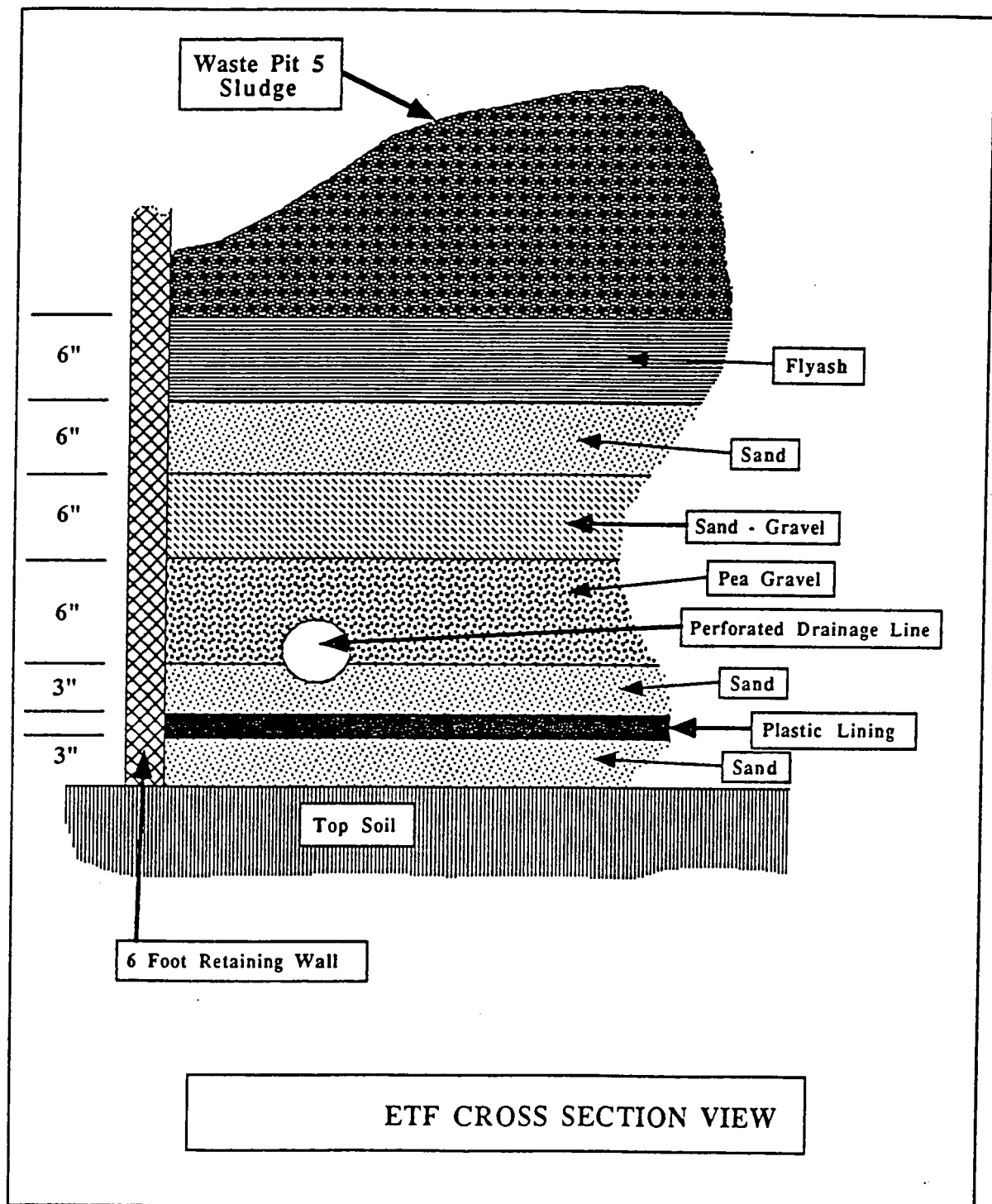


FIGURE 2.  
ETF CONSTRUCTION DIAGRAM

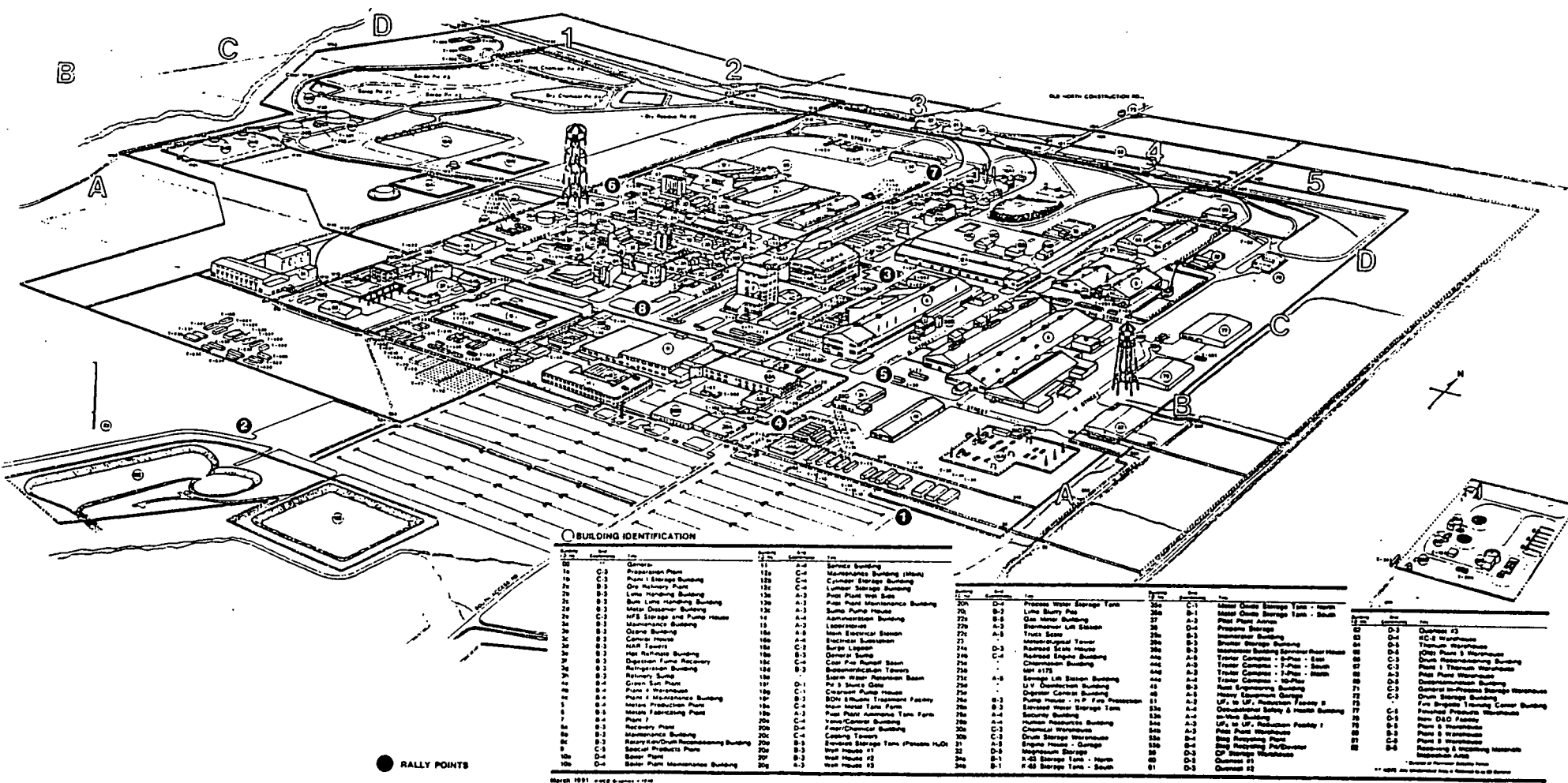
2502

FIGURE 3.  
ETF FILTER BED DIAGRAM

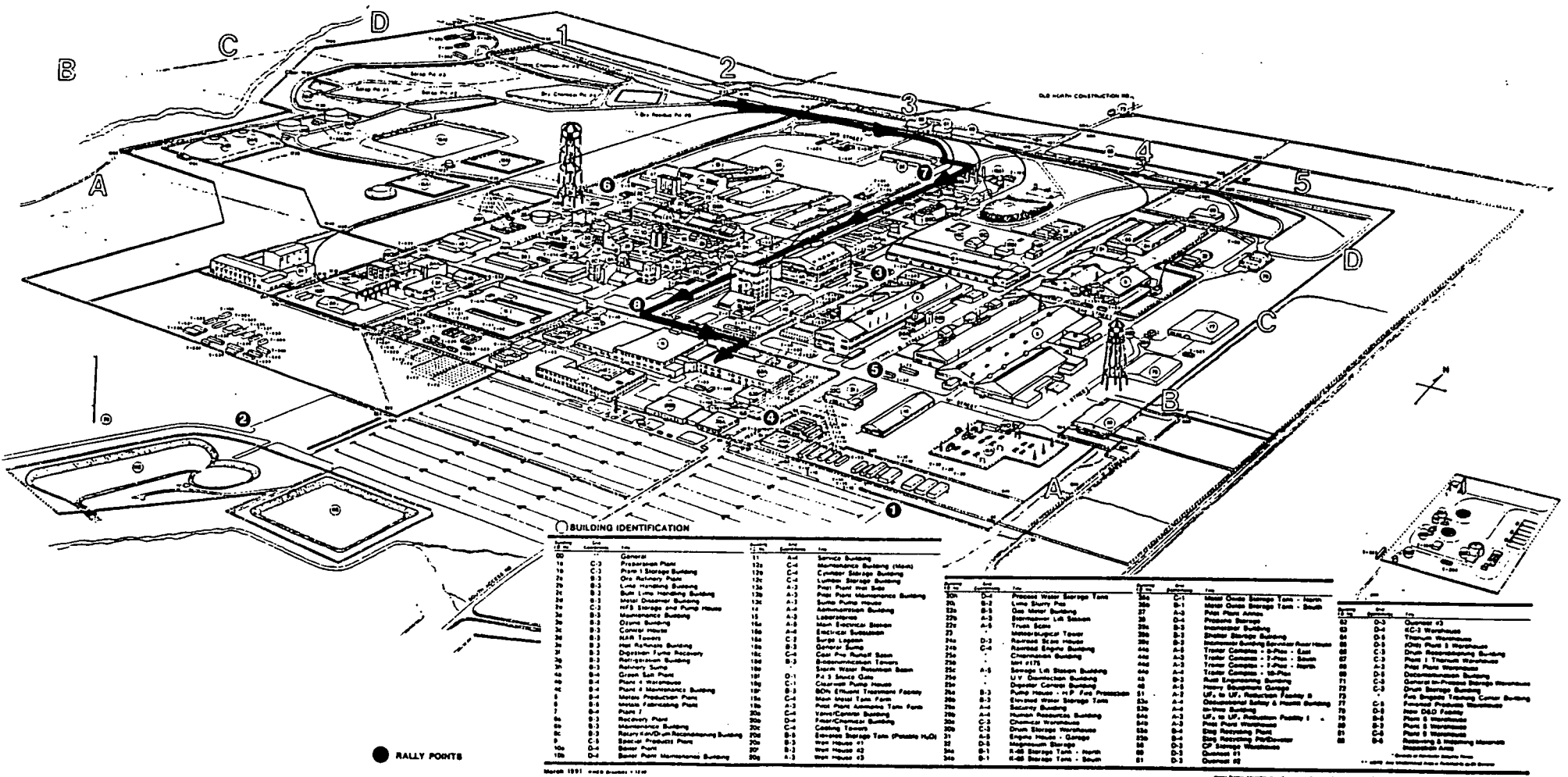




**FIGURE 4.**  
**P RALLY POINTS**



**FIGURE 5.  
ROUTE TO NEAREST MEDICAL FACILITY  
(BUILDING 53)**



2502

**TABLE 1.**  
**OPERABLE UNIT 1 - WASTE PIT 5 CHARACTERISTICS**

<u>DESCRIPTION</u>	<u>QUANTITIES AND UNITS</u>	<u>REFERENCES AND/OR COMMENTS</u>
Radioactive Materials		Reference 1.
Radium-226	235 to 999 pCi/gram	
Uranium-235	14 to 79 pCi/gram	
Uranium-238	387 to 1230 pCi/gram	
Thorium-230	3080 to 20200 pCi/gram	
Thorium-232	21 to 90 pCi/gram	
Technetium-99	423 to 2990 pCi/gram	
Volatile Inorganics		Reference 1.
Arsenic	139 to 2800 mg/kg	
Mercury	1.9 to 6.2 mg/kg	
Organics		Reference 1.
PCBs - Aroclor 1254	750 ppb	
HSL Semi-volatiles		The concentration level for HSL semivolatiles analyzed was below quantification level. See Appendix B of Reference 1 for concentrations.

**TABLE 1**  
**(continued)**

<u>DESCRIPTION</u>	<u>QUANTITIES AND UNITS</u>	<u>REFERENCES AND/OR COMMENTS</u>
HSL Inorganics		Reference 1.
Aluminum	6373 to 15400 mg/kg	
Calcium	11600 to 206144 mg/kg	
Iron	10979 to 17900 mg/kg	
Magnesium	807 to 63200 mg/kg	
Arsenic	139 to 2800 mg/kg	
Mercury	0.4 to 1.8 mg/kg	
Vanadium	792 to 5380 mg/kg	
Hazardous Materials/Wastes		Reference 1. All samples were within the established limits for corrosivity, ignitability, and EP Toxicity.
Listed Hazardous Materials		The concentration level for all listed hazardous materials analyzed was below quantification level. See Appendix B of Reference 1 for concentrations.

References:

1. Weston, Roy F., November 1987, "Characterization Investigation Study Volume 2: Chemical and Radiological Analyses of the Waste Storage Pits," prepared for Westinghouse Materials Company of Ohio, Cincinnati, OH.
2. Advanced Sciences, Inc., October 1986, "Remedial Investigation of the Feed Materials Production Center, Fernald, Ohio, Part I: Evaluation of Current Situation," prepared for Westinghouse Materials Company of Ohio, Cincinnati, OH.
3. Weston, Roy F., March 1988, "Geotechnical Evaluation of Feed Properties of Waste Pit Materials at the Feed Materials Production Center, Fernald, Ohio," prepared for Westinghouse Materials Company of Ohio, Cincinnati, OH.
4. Appendix F of Reference 1 - Geological Description of Waste Pit Borings.